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Figure I—Henry II, King of France, from the engraving of Étienne de Laulne (1510-1595)

The "Relation" of Andreas Vesalius on the Death of Henry II of France

CHARLES DONALD O'MALLEY

and

J. B. deC. M. SAUNDERS*

TRAGEDY in one form or another was the constant companion of the House of Valois. Scarcely a dozen years had elapsed since the sole remaining son of Francis I had followed on its way to Saint-Denis the melancholy cortege which marked the funeral of his father, as earlier ones had indicated the passing of his brothers, Francis and Charles. And now the sceptered pall would once more be required for the only survivor of the immediate family of the "First Gentleman of France."

On July 30, 1559, Henry II of France was wounded in a joust and subsequently died as a result of his injuries. The incident was the untoward outcome of the treaty of Cateau-Cambrésis and this unforeseen tragedy, despite the personal insignificance of Henry, who, as far as monarchs may be evaluated, was no considerable loss to France, was to set in motion a chain of events of the utmost political significance.[1] To the historian of medicine, the incident is of singular importance and interest because of the distinction of the notable group of physicians who

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[1] The unforeseen death of Henry left his fifteen-year-old son Francis as nominal king. Already the husband of Mary Queen of Scots, whose mother, Mary of Guise, had been the wife of the Stuart James V, Francis was therefore allied by marriage to the Guise family who now, with the forces of France and of Scotland united, sought the English throne for Mary Stuart. Politics were masked by religion, and Catholics refused to recognize the validity of Elizabeth's claim. The result was bitter persecution by both sides, a Calvinist rising in Scotland, incited by John Knox, and the eventual execution of Mary and the establishment of the Presbyterian church organization. In France politics, this time on a more local and national scale, were rampant and again disguised by religion. With a youth for king and a woman (Catherine de' Medici) for regent, the nobility saw its opportunity to regain those powers previously lost to the strong centralizing monarchs. With three youthful sons of Henry as successive monarchs, the nobility and the churches—Catholic and Calvinist—were determined to make the most of their opportunity. Hence the dreary interval of civil war in France with now Catholic and now Huguenot (according as each saw his opportunity for political gain) rebelling against royal authority until finally, and only after a series of desolating wars, a strong ruler, Henry IV, was once more established on the French throne.

gathered at the bedside of the injured monarch. From them, as well as from the memoirs and writings of other lay and ecclesiastical personages of the times, we possess several accounts of the affair. To these must now be added the postmortem *Relation* of Andreas Vesalius which seems to have been entirely neglected by historians of medicine and biographers of the eminent anatomist.

Henry II as king was not a dominant force. Content to live under the personal influence of his crafty and unscrupulous wife, Catherine de' Medici, and of his bold and possessive mistress, Diane de Poitiers, he permitted the government to become the object of dispute between the two powerful families of Montmorency and Guise. In general, the former may be called the party of peace and had certain leanings toward the reform movement, while the latter saw its opportunity in war and was staunchly Catholic.

At this period the ruler of Spain was Philip II, not a bellicose monarch. Indeed, peaceful relations between France and Spain had been established by the truce of Vaucelles in February 1556, and the outbreak of the new war in the same year was an inexcusable breach of the peace by France which had been strongly urged to this step by the Pope Paul IV, who was guided solely by personal desire and hatred of Spain.

The war at first went badly for France which suffered overwhelming defeat at St. Quentin, a campaign, incidentally, described by Ambroise Paré.[2] As a consequence of defeat, the fortunes of the Montmorency, who held the leadership and therefore the responsibility, suffered decline. But under the new leadership of Francis of Guise, a decided change of fortune occurred late in 1557, and defeat was solaced by victory with the siege and capture of Calais, the last of the English possessions in France; for the English under Queen Mary, wife of Philip II, were in alliance with Spain.

Yet by 1558 both France and Spain were desperately desirous of peace. From the beginning, Philip had had no strong inclination for war, and now both monarchs were exceedingly hard-pressed to obtain military funds and supplies. The result was the treaty of Cateau-Cambrésis. Whether this peace indicated victory or defeat for either contestant is here beside the point.[3] What is of importance for us is the fact that, in the

[2] A. Paré, *The Workes of that famous Chirurgion Ambrose Parey.* (London, 1634), XXIX *(Voyages)*, pp. 771-772.

[3] Briefly, this peace meant the end of a struggle some sixty years long which would never be resumed in its same form. Savoy was established as a buffer state between France and Italy under Spanish control, and the Dukes of Savoy in the centuries to follow were to use this position to good advantage, and eventually it was to play

tradition of the age, it was felt that dynastic marriage would assist the improvement of relations between the erstwhile enemies. As a result, Philip II, whose English wife had in the meanwhile died, was married to Elizabeth of France, daughter of Henry II, and Emmanuel Philibert of Savoy married Marguerite, sister of the French king. It was in conjunction with the celebration of these marriages in Paris that Henry II was to meet his death.

The marriage of the Spanish ruler and Henry's daughter was to be solemnized on June 22, 1559, and that of the Duke of Savoy and Marguerite on July 1. The Duke of Savoy would be present for his marriage, but Philip, represented by the Duke of Alva as a proxy, was apparently content to gaze upon the portrait of his bride which had been sent to him at Brussels by the French king and was hung in his private chamber.[4]

Henry was determined that no effort should be spared on an occasion of such tremendous importance, and preparations for the event were in progress throughout May and June. "The king," wrote the English ambassador, "has borrowed 1,100,000 crowns to defray the setting out of these triumphs and for the entertaining of the princes which come hither."[5] A little later the same observer wrote that "the Duke of Alva and the other Spanish commissioners are looked for within four or five days. Great preparations are made for them at Chantilly and Ecouen, two houses of the Constable [Montmorency]. Here the king himself, the dauphin, and the nobles and gentry of the court do daily essay themselves at the tilt which is like to be very grand and sumptuous, with great triumph and solemnity."[6]

The Duke of Alva, in company with William of Nassau, Prince of

no small part in bringing about a united Italy. The treaty made concessions to France in the east in the area between the Netherlands and the northern slopes of the Alps. The result of this was to focus attention and to bring international conflict to this area during the seventeenth century. In short, the peace of Cateau-Cambrésis marked the end of one era and the beginning of another. It is interesting to note that within the space of one year so many of the actors in the previous scene had passed from the stage—Henry II, Mary of England, Charles V, Paul IV—while in the same period the marriages of the Spanish Habsburg, Valois and Savoy were to have such important implications for the new and future era. On the whole question of this war and peace *cf.* Henry Lemmonier, *La lutte contre la maison d'Autriche. La France sous Henri II (Histoire de France,* ed. Ernest Lavisse, V, pt. ii), pp. 161ff.

[4] L. Romier, *Les origines politiques des guerres de religion* (Paris, 1914), II, p. 377.

[5] *Calendar of state papers, foreign series, of the reign of Elizabeth,* ed. Joseph Stevenson (London, 1863), vol. I, p. 303, Throckmorton to Sir Wm. Cecil, June 6, 1559.

[6] Patrick Forbes, *A full view of the public transactions in the reign of Elizabeth* (London, 1740), vol. I, p. 122, Throckmorton to the Privy Council, June 10, 1559.

Orange, the Duke of Egmont,[7] and a brilliant retinue of nobles, arrived on June 15. They were first greeted at Saint-Denis by the Cardinal of Lorraine, and at Chantilly by Henry himself. Celebration was now to follow celebration and in particular tournaments and jousts in which the princes and nobles might distinguish themselves. The court was lodged at the Hôtel des Tournelles, on what is now the Place des Vosges. Before this palace and in the widest part of the Rue Saint-Antoine the paving had been torn up for the construction of the lists, and galleries were built for the spectators at either end.[8]

On June 21 the betrothal of Philip II and the Princess Elizabeth took place in the great hall of the Louvre. This was followed on the next day by the marriage ceremony which was performed at Notre-Dame with great pomp and magnificence. The occasion ended with a banquet, which, however, was somewhat marred by the failure of Francis of Montmorency, who on this occasion had assumed his father's rôle of Grand-Master, to reserve places for several of the invited dignitaries.

The next cause for celebration would be the marriage of the Duke of Savoy to Marguerite. The Duke had arrived in Paris in time for the previous ceremony of betrothal, and on June 28 the second marriage contract was signed. With a curious resurgence of mediæval chivalry, the ceremonies were followed by a three days' tournament—its fatal result was to make it the last ever held by the court of France.

On Friday, June 30, the third day of the tourney, the King, wearing the black and white colours of his mistress, Diane de Poitiers, entered the lists in company with Francis of Guise, Alfonso d'Este,[9] the Duke of Ferrara, the Duke of Savoy, and the Duke of Nemours. Although it was properly the duty of Boisy, the Grand Equerry, to equip the king, on

[7] Vesalius stood high in the esteem of the Egmont family and was often called in as an adviser in times of illness. At the request of the young Duke's wife, he had performed an autopsy on the body of a young noblewoman who was suspected of having been poisoned by her uncle. However, death was established as having been due to natural causes. The opportunity was utilized by Vesalius to establish the existence of the hymen, a matter of considerable dispute at this time. In 1548, he had also predicted the death of Maximillian of Egmont, Count of Buren and a member of a collateral branch. It was the accuracy of this prediction which established and greatly extended his reputation as a physician. Vesalius, *Epistola, rationem modumque propinandi radicis Chynae decocti* . . . (Basileae, 1546), p. 141. De Thou, *Histoire universelle* . . . (London, 1734), I, p. 364.

[8] Forbes (Note 6), p. 142, Throckmorton to the Privy Council, June 21, 1559. A defiance against all comers was published at the end of May and carried the names of the king, the Duke of Ferrara, the Duke of Guise, and the Duke of Nemours; *cf.* Alphonse de Ruble, *Antoine de Bourbon et Jeanne d'Albret* (Paris, 1881), I, p. 320.

[9] It was at a consultation held at Ratisbon in July 1546, over the illness of a relative, Francesco D'Este, that Giambattista Canano (1515-1578), the eminent anatomist of Ferrara, made the portentous announcement to Vesalius of his discovery of the venous valves.

this occasion Henry gave that honour to Vieilleville who took the opportunity to warn him of the dire portents of the day. But Henry was impatient to meet the Duke of Savoy who was already at the barrier. The course was run without harm to the King, although the shock of the lance forced the Duke to rest himself upon his saddlebow. Next, Henry broke a lance with the Duke of Guise and then with Count of Mongonmery.[10] It appears that Henry was doubtful of his showing against Mongonmery and, fearful of losing the honours of the day, he sought a second encounter.[11]

The events which were now to follow occurred with such rapidity and concluded with such shocking surprise as to tax the reliability of witnesses in respect to continuity and precision of detail. While there are many accounts, most of them were written long after the events and so are marred by faults of memory. Two accounts, however, were written almost immediately after the fatal encounter. The English ambassador Throckmorton was present at the tourney and wrote an account of the proceedings the same evening, although he dated it July 1. The second account is that of Antoine Caraccioli, Bishop of Troyes, to Cornelio Musso, Bishop of Bitonto. Of these two accounts the latter is somewhat more detailed, but both were written entirely from the viewpoint of spectators in the galleries, which perhaps gives to them a certain impersonal precision in description of observable facts. There are, however, other accounts, perhaps not so trustworthy in this respect, but which contain certain valuable bits of information of a personal nature and were based upon last-minute conversation with the actors in the tragedy.

The significant portion of Caraccioli's account[12] runs as follows:

> The jousting lasted for some time until the king, mounted on a horse belonging to the Duke of Savoy (who, since he remained in the galleries with the ladies to watch the king, did not don his armour), and having performed and exhibited his prowess with much excellence, dispatched a gentleman to the Duke to tell him that this fine horse of his had assisted him to strike those good thrusts with the lance.[13] The Duke replied that he was delighted that his horse had been of such

[10] Gabriel de Lorges, Comte de Mongonmery, according to his signature, was born *c.* 1530, and at this period was captain of the Scottish Guard of Henry II.

[11] *Mémoires de la vie du Maréschal de Vieilleville (Nouvelle collection des mémoires pour servir à l'histoire de France,* ed. Michaud et Poujoulat, IX), Paris, 1838, p. 283.

[12] Caraccioli to Cornelio Musso in *Delle lettere di principi le quali o si scrivono da principi o a principi o ragionano di principi. Libro terzo* (Venice, 1581), pp. 194-198.

[13] The judges were the Seigneur de Tavannes and the Constable Montmorency. *Mémoires de très-noble et très-illustre Gaspard de Saulx, Seigneur de Tavannes (Mémoires pour servir à l'histoire de France,* VIII) Paris, 1838, p. 225.

service to the king, but he begged him, as did also the queen and the ladies, and the nobles who accompanied them, not to exert himself further that day, since the victory was his, the hour late,[14] the weather extremely hot, and the tournament ended.[15] The gentleman departed to carry this message to the king, whom he found prepared to run another course. He had already demanded a fresh lance, although several princes, and particularly he of Ferrara, had begged him to tilt no more that day. But his hour was at hand, and the more they entreated him the more obstinate he became, and opposed their wishes, while swearing on the faith of a gentleman that he would break one lance the more.[16] Then he ordered the Captain Lorges, a very valiant young noble and captain of the Scottish Guard, to come to him, and, when the latter approached, ordered him to run against him. This gentleman excused himself and begged the king not to command him. His Majesty became angry to the degree that Lorges turned his bridle, took a lance and tilted against the king. He struck the king on the gorget, a little below the visor; his lance was splintered, and the stump glancing upwards raised the visor, into which a splinter entered and wounded the king above the right eye. So strong and violent was the blow that the king inclined his head toward the lists, endeavouring to recover his seat, turned towards the other side of the lists, and would have fallen, if the princes and gentlemen who were at hand on foot and on horseback had not come to his aid.[17] They relieved him of his armour and found him fainting, the splinter in his eye and his

[14] It was five o'clock in the afternoon. Romier (Note 4), p. 379.

[15] A presentiment of danger seems to have caused uneasiness to several persons. The sources of this were probably the well-known impetuosity of the King and the dangers inherent in the sport, as well as the fact, known to Henry's intimates, that upon over-exertion he was subject to attacks of vertigo and had had a severe one not long before after playing tennis. Forbes (Note 6), p. 92, Throckmorton to Sir William Cecil, May 15, 1559. Vieilleville wrote in his *Mémoires*, p. 283, that while putting on Henry's helmet he had had a presentiment of danger, and that for three nights in succession he had dreamt of a fatality to the King on this day. However, this is a mild statement when compared with the flood of stories that arose respecting prophecies and premonitions of the King's fate. The most literary and at the same time the most fantastic was that of Nostradamus:

> Le lion jeune le vieux surmontera
> En champ bellique par singulier duel;
> Dans cage d'or les yeux lui crèvera;
> Deux playes une, puis mourir mort cruelle.

The *lion jeune* is Mongonmery, nearly twenty years younger than the King; the *cage d'or* is the gilded casque of the King; *deux playes une* is the internal and external wound. So much for ingenious explanation.

[16] According to the rules of the tourney, the defender of the lists must defend them against three challengers. The challenger was allowed one run. Thus Henry had acquitted himself well in defense against the Duke of Savoy and the Duke of Guise. But young Mongonmery ran the course without hesitation and broke his lance so well with Henry that it was apparently difficult to judge between them. According to Vieilleville, Henry would seem to have had suspicion that he had been bested, since "the King . . . wished to have his revenge." Mongonmery attempted to excuse himself from further combat on the ground that he was allowed only one course and that a second would be unfair to the remaining contestants. *Mémoires de Vieilleville* (Note 11), p. 283.

[17] "Which stroke was so vehement, and the pain he had withal so great, as he was much astonished, and had great ado (with reeling to and from) to keep himself on horseback." After the fatal blow the horse continued to gallop up to the gate of the Hôtel Graville, almost to the base of the platform on which the English ambassador sat. Thus Throckmorton had an excellent view of the termination of the accident. "And as I could discern, the hurt seemed not to be great; whereby I judge, he is but in little danger. Marry, I saw a splint taken out, of a good bigness; and nothing else was done to him upon the field, but I noted him to be very weak, and to have the sense of all his limbs almost benumbed; for being carried away, as he lay along, nothing covered his face, he moved neither hand nor foot, but lay as one amazed," Forbes (Note 6), p. 151, Throckmorton to the Privy Council, July 1, 1559.

face covered with blood. They sought to revive him with fresh water, rosewater and vinegar, but although he recovered consciousness, yet before he reached his chamber he fainted twice.[18] The unhappy young seigneur de Lorges, though he was wounded in his soul, by reason of the anguish which he suffered, as was the king in his body, because of his wound, when the king had recovered his senses for the first time, hastened to kneel before him, and without making any excuse or placing the blame for this upon the command of His Majesty, begged him to cut off his hand and his head. However, the good-natured king, who had no equal for kindness in his day, answered kindly that he was not angry with him, and that he had nothing to pardon, since he had obeyed his king and carried himself like a brave knight and a valiant man-at-arms.[19]

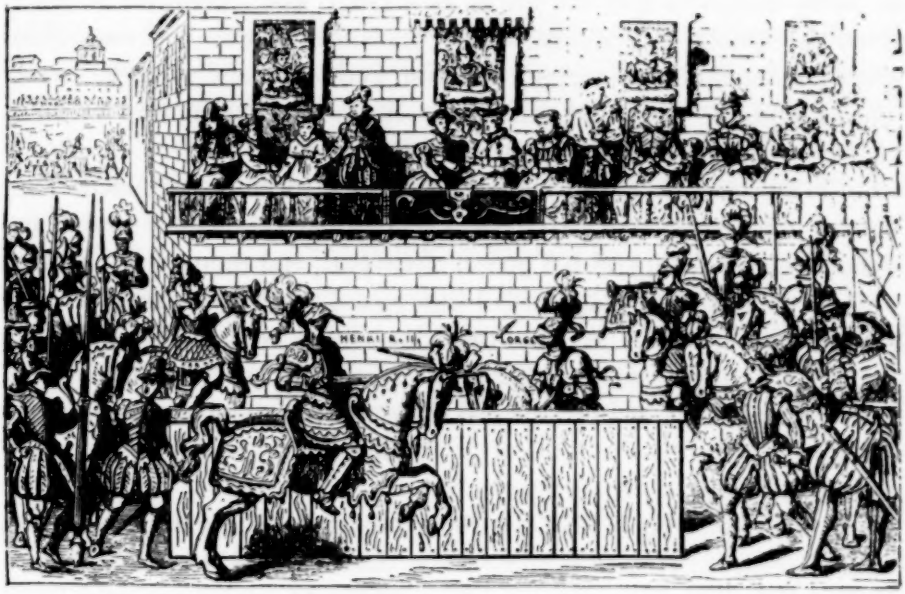

Figure 2—The fatal joust between Henry II and the Comte Mongonmery before the Hôtel des Tournelles. From the engraving by Tortorel and Périssin, 1570.

[18] Vesalius in his *Relation* given below, says that Henry mounted the steps to his chamber, scarcely tottering.

[19] Despite Henry's pardon, Mongonmery was banished to his estates in Normandy after the King's death. There he whiled away his boredom by the study of religious controversy and ended up as a convert to the reform movement. As a result he participated in the religious wars in France, barely escaped with his life from Paris during the massacre of St. Bartholomew and sought refuge in England. From there he organized several attacks on the French coast. In 1574 he landed with English volunteers in Normandy where he was besieged by a large French force and compelled to surrender. The Queen-mother and widow of Henry II, Catherine, held the most violent hatred of her husband's unwitting assassin, and on June 26 brought about his condemnation on a charge of high treason. L'Estoile in his *Journal* declares that Catherine herself witnessed the decapitation and quartering. Mongonmery, however, had become a person and a symbol of such importance that one of the clauses of the Peace of Monsieur, in February 1576, specifically declared that this execution was a miscarriage of justice.

The Constable took one arm of the fallen King, the Cardinal of Lorraine and François de Guise the other, the Prince of Condé and M. de Martigues the legs, while M. de Sancerre supported the head. In this fashion Henry was carried to the Hôtel des Tournelles. But at the base of the staircase Henry "displaying the courage and vigour of a true king," requested to be allowed to ascend on foot, and he accomplished this with some assistance.[20]

As soon as the King had entered, the gates were closed and closely guarded. The servants of the nobility were ordered to remain at a distance, and of the many distinguished foreigners, at first only the Dukes of Savoy and Alva and the Prince of Orange were permitted to enter. Even the Queen was at first denied entrance. "There was marvellous great lamentation and weeping for him, both men and women," wrote Throckmorton. "Thus God makes Himself known, that in the very midst of these triumphs suffers such heaviness to happen."[21]

The court physicians and surgeons were speedily assembled. They dressed the wound and extracted several small splinters of wood and then purged the King with a potion of rhubarb and mummy,[22] bled him of twelve ounces of blood, purged him again, applied refrigeratives, and gave him barley-gruel, the usual medicine of the feverish. The King sank into a deep stupor and did not give any sign of pain.[23] The Duke of Savoy, the Cardinal of Lorraine, the Constable Montmorency and Francis of Guise demanded the honour of watching over the King and so remained all night in the sick-room.[24]

Next morning Throckmorton completed his letter to the Privy Council with the remark that the King "had had a very evil rest, whereof there was great lamentation at court."[25] But Montmorency, who wrote to Queen Elizabeth during the night, gave a more favourable estimate: "The wound is very severe, but the first and second dressing give good hope that the result will be satisfactory, and that the worst that can happen will be the loss of the eye."[26] The same opinion was expressed in a letter

[20] Romier (Note 4) p. 380, citing numerous ms. accounts.

[21] Forbes (Note 6), p. 151, Throckmorton to the Privy Council, July 1, 1559.

[22] Luigi de Gonzaga to the Duke of Mantua, Paris, July 1: "Hor messo in letto, gli medici de liberorno di darci una medicina pi reubarbo et momia et ucolepo rosato, se ben mi raccordo, laqual tenuta tre o quatro hore la vomitò tutta." Cited from the ms. by Romier (Note 4), p. 382.

[23] See the *Relation* of Vesalius below.

[24] Forbes (Note 6), p. 152, Throckmorton to the Privy Council, July 1, 1559. Catherine appears to have been admitted later, and the Queen, the Duke of Savoy, and the Cardinal of Lorraine shared the honour of watching over Henry until three o'clock in the morning when the other privileged persons relieved them. Gonzaga in the letter cited, Romier (Note 4), p. 383.

[25] *Ibidem.*

[26] *Calendar of state papers, foreign series,* Elizabeth, I, p. 345.

of Anne of Cossé to the Marshal Brissac, written after the wound had been dressed on July 1: "At ten o'clock [in the morning] the wound was dressed and found to be better than was thought possible. However, it is believed that he will lose the eye . . . but one can not yet judge with certainty."[27]

After the wound had been dressed, at eleven o'clock the King was given nourishment although he had no appetite for food. He then fell into a deep sleep and awakened at intervals only long enough to satisfy his thirst. His pulse rate was only slightly accelerated, and the slight fever which he had had hitherto lessened at four in the afternoon.[28]

Immediately after the accident gentlemen of the court had been dispatched in all directions to seek out celebrated physicians. "As soon as His Majesty was struck, the Duke of Savoy dispatched a messenger to Flanders for Vesalius, the great surgeon, who arrived here today."[29] The news of the accident reached Philip in Brussels on July 2. "They had immediately sent to the court of the King's Majesty, our sire, which at that time was in Flanders, for Doctor Vesalius."[30] Meanwhile in Paris optimism was fading. The King's condition was showing no improvement, and the surgeons began to fear that the blow had torn the coverings of the brain. A consultation was held in which all possible methods of treatment were explored,[31] and the stump of Mongonmery's lance was used for experimental thrusts at the heads of four criminals who had been decapitated on the previous day; the skulls were then dissected, but this grisly empirical procedure failed to indicate the secret of the wound.[32] On the fourth day the patient developed a violent fever which, says Vesalius, was thwarted by purgative medicines. However, a delirium followed, and little by little indications of the damage to the brain made their appearance.[33]

The initial consultation attended by Vesalius was enlivened by the asinine remarks of an ignorant Spanish surgeon who had accompanied Vesalius on his journey from Brussels. This gentleman had been serving the court in the position of temporary alcalde and on hearing the news

[27] Ruble (Note 8), p. 431. During the dressing the Dauphin was brought into his father's presence and promptly proceeded to faint twice, thus, no doubt, adding to the tribulations of the attendant physicians.

[28] Gonzaga to the Duke of Mantua, letter cited. Romier (Note 4), pp. 383-384.

[29] G. Roviglio to the Duke of Ferrara, Paris, July 3. Romier (Note 4), p. 382.

[30] Dionisio Daza Chacon, *Practica y teorica de cirugía en romance y en latin* (Madrid, 1678), I, p. 174.

[31] In the *Relation* of Vesalius below.

[32] Vieilleville (Note 11), p. 283.

[33] In the *Relation* of Vesalius below.

of Henry's accident had importuned the court favourite to send him to Paris to participate in the treatment of the King. The protomedicus, Jean Chapelain, taking him to be a surgeon of considerable consequence, had reserved for him the place of honour by requesting him to give his opinion last. At the conclusion of the ceremony, the attendant physicians and nobles waited, "like the Carthaginians when Aeneas wished to speak from the throne," for the profound and wise discussion to be anticipated from such a distinguished master of the art. The unfortunate surgeon, knowing little Latin and no French, proceeded to give his opinion in a mixture of Spanish and barbarous Latin saying things which were better left unsaid, and "the French were in such a state that they did not know whether they saw it or whether they were dreaming it, because, although they saw it, they could not believe it."[34]

Vesalius reached Paris on the 3rd, and according to Adam Henricpetri, "as soon as he entered the King's chamber, he made trial with a clean white cloth which he put in the King's mouth [to bite] and then pulled it out with some force; whereupon the King threw his hand to his head and cried out from the pain. By the depth of the pain Vesalius was able to judge that he would not recover. *Chironium vulnus,*[35] he said, a wound that will not heal."[36]

With the arrival of Vesalius, who was put in charge of the case,[37] a second consultation became necessary.

> Having reached his destination, he saw the wound of the king, and it was decided to hold a consultation over the matter. There were many very distinguished physicians and surgeons, all very learned in Latin and Greek, and skilled in surgery. It is customary there that when the physicians gather to treat some sickness, especially in the case of a royal personage, they all sit down and the Chaplain,[38] as we would say here Protomedicus, attends and orders whomever he thinks should give his opinion; and to honour Doctor Vesalius and his companion, he left them to speak last. The French began to speak . . . So Vesalius gave his opinion with that Latin and with that facility which I have seen in many consultations (which I have had

[34] Daza Chacon (Note 30), I, pp. 174-175.

[35] The Telephian or Chironian wound was one which could not be cured. Chiron, praeceptor of Achilles in medicine, was however skilled in its treatment and passed on the secret to his pupil. Telephus, son-in-law of Priam and King of Mysia, was wounded by Achilles' famous spear which was able "to kill and cure." On learning from an oracle that he could be cured only by his adversary, he sought out the Greek warrior and agreed to lead his enemies to Troy in exchange for treatment. "Vulnus Achillaeo quae quondam secreat hasti, Vulneris auxilium Pelias hasta tulit." Ovid.

[36] Max H. Fisch, "Vesalius in English State Papers," *Bulletin of the Medical Library Association,* 1945, *23,* 244-245.

[37] *Calendar of state papers, foreign series,* Elizabeth, I, p. 364.

[38] Daza Chacon confused the position with the man. It was Henry's first physician, Jean Chapelain, to whom reference is made here. It was also Chapelain who had summoned Paré to the case.

with him) and treated of the essence of the wound, the signs and prognoses, and the treatment of it which a good surgeon would be obliged to observe, and all with such wisdom that it was no wonder that all were very satisfied and admiring.[39]

Not only did Vesalius have the direction of the case, which no doubt carried with it considerable nervous strain in view of the momentous issues at stake, but he was doubly burdened by importunate courtiers. In particular, the death of Henry could well mean the ruin of the Montmorency family, and for this reason if for no other, the Constable had an especial interest in the case. "The Constable is so curious about the King's accident that he caused the body of an unfortunate man who was assassinated yesterday to be preserved until the arrival of Vesalius, and he wished the latter to show him in the dead man's head the anatomy of the King's injury."[40]

However, the King's condition was becoming obviously worse, and his doom was apparent to all. Vieilleville recounts that on the 8th Henry had an interval of consciousness, during which he sent for the Queen and ordered her to hurry on the marriage of his sister, and that he then made her sign Vieilleville's brevet of marshal, which he had intended to sign himself, and commended to the Queen his kingdom and his children.[41] However, no mention of this scene occurs in the other contemporary accounts, and it would seem that by this time the King must have been unable to talk to anyone. However, whether by Henry's direction or otherwise, the marriage was celebrated at midnight in the little church of Saint-Paul which adjoined the Hôtel des Tournelles. The ceremony was particularly lugubrious, and those in attendance seemed more like mourners at a funeral, which no doubt was more in their thoughts than the marriage.[42]

Since all hope had now been abandoned, Paris became a city of mourning. Queen Catherine ordered public prayer for Henry and forbade the ringing of bells.[43] On the 9th the parochial clergy of Paris organized a general procession for the King's recovery, and on the same day the last sacraments were administered. The Bishop of Toulon, Jerome de la Rovère, stated in his funeral sermon that after receiving the sacraments, the King summoned the Dauphin and "recommended to him his church

[39] Daza Chacon (Note 30), I, p. 175.

[40] G. Roviglio to the Duke of Ferrara, Paris, July 3, ms. cited by Romier (Note 4), pp. 384-385.

[41] Vieilleville (Note 11), p. 284.

[42] *Ibidem.*

[43] *Oeuvres complètes de Pierre de Bourdeille, Seigneur de Brantôme. Publiées . . . pour la Société de l'histoire de France par Ludovic Lalanne* (Paris, 1873), VII, p. 349.

and his people, and declared that he persisted and remained firm in the faith in which he was dying."[44] But this pious story must be suspect since it is doubtful if Henry was now capable of lucid thought or speech.

Desperate remedies were now in order, and during the evening the physicians once again discussed the possibility of trephining. But as night drew on the King, ever more enfeebled, broke out in a profuse sweat, "the sweat of death," which was to last throughout the night and which

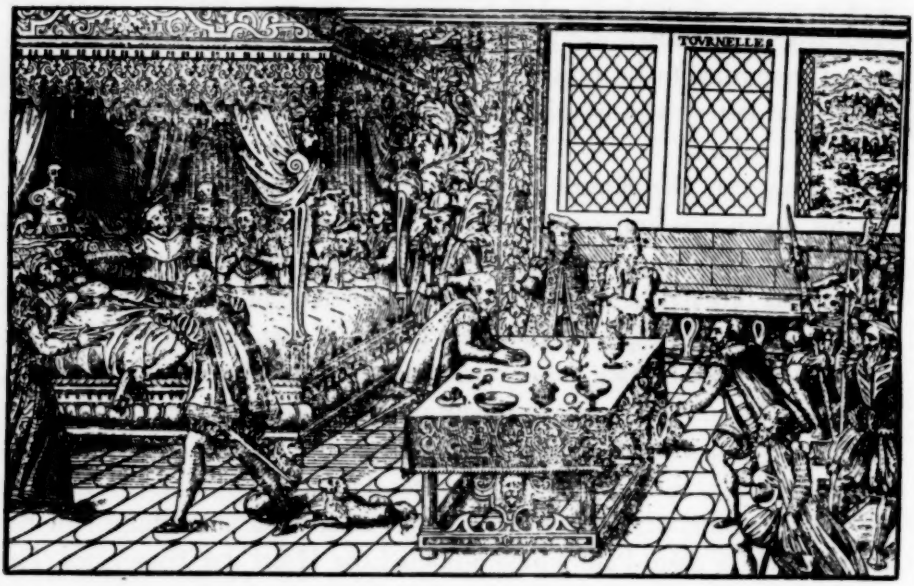

Figure 3—The death-bed scene of Henry II from an engraving by Tortorel and Périssin *circa* 1570. In the background on the left, the Cardinal of Lorraine, the Constable of France, Catherine de' Medici and the Dauphin may be identified. In the center background three of the physicians, presumably Jean Chapelain, Andreas Vesalius, and Ambroise Paré from left to right. It has been suggested, with more possibility than probability, that the figure in the foreground holding the cloth is Vesalius about to carry out the test mentioned in the text.

convinced them that all remedies would be in vain.[45] Prior to his death, Henry's left side suffered from a paralysis while the right was shaken by violent convulsions. Respiration became more difficult, and finally death

[44] Ruble (Note 8), pp. 329-330.

[45] G. Roviglio to the Duke of Ferrara, Paris, July 9, ms. cited by Romier (Note 4), p. 388.

appeared, hastened, according to Vesalius, by a draught of wine which had been concocted with sage and other irritating substances. Henry, just forty years old and in the twelfth year of his reign, died at one o'clock in the afternoon.[46]

* * *

Vesalius had arrived on the 5th day after the King had been injured. It should be noted that immediately after the accident a messenger had been sent to summon Vesalius who was ordered to leave for Paris by special coach. When we consider that among the physicians in Paris was the great Paré, the summons and the fact that Vesalius was placed in charge of the case upon his arrival should be sufficient indication that his reputation in Europe was now supreme. However, he was unable to restore the French king, and, indeed, as the postmortem indicates, that was a task beyond mortal ability. Yet despite this failure, if in justice to the medical art of the sixteenth century it can be called failure, the presence at the autopsy of the greatest anatomist of that day meant that it would be as searching and as complete as sixteenth-century knowledge permitted.

Vesalius' *Relation* or account of the postmortem examination seems curiously to have been overlooked, and our knowledge of the cause of death of Henry II has in recent times been based upon the brief account of Paré.[47] We have, therefore, in the following, not only a more extended and searching description but one more precious fragment of Vesalian literature.

[46] In the *Relation* of Vesalius below.

[47] "A great part of these accidents appeared in King Henry of happy memory, a little before he dyed. He having set in order the affairs of *France*, and entered into amity with the neighbouring Princes, desirous to honour the marriages of his daughter, and sister, with the famous noble exercise of Tilting, and he himself running in the Tilt-yard, with a blunt-lance received so great a stroak upon his Brest, that with the violence of the blow, the vizour of his helmet flew up, and the trunchion of the broken Lance hit him above the left Eyebrow, and the musculous skin of the Fore-head was torn even to the lesser corner of the Left Eye, many splinters of the same Trunchion being struck into the substance of the fore-mentioned Eye, the Bones being not touched or broken; but the Brain was so moved and shaken, that he dyed the eleventh day after the hurt. His skull being opened after his death, there was a great deal of bloud found between the *Dura*, and *Pia Mater*, poured forth in the part opposite to the blow, at the middle of the Suture of the hind-part of the Head; and there appeared signs, by the native colour turned yellow, that the substance of the Brain was corrupted, as much as one might cover with ones Thumb. Which things caused the death of the most Christian King, and not only the wounding of the Eye, as many have falsly thought. For we have seen many others, who have not dyed of farr more grievous wounds in the Eye." Paré (Note 2), X, ix, 249.

[RELATION OF ANDREAS VESALIUS ON THE DEATH OF HENRY II][48]

[July 1559]

The tragic termination of the royal injury

On Friday in a public passage of arms, Henry the most Christian King of France, received from the lance of a certain young man a direct thrust a little below the root of the neck upon the side armour commonly employed in single combat. The lance was broken through its wooden stock by the impact in such a way that on striking the part of the helmet lying below the eyes, which on that occasion was open, it drove upwards as if by a second thrust into the face of the king, while the remainder of the lance, which was still held in the hand of the noble, was shattered into splinters.

The lance first struck the middle of the eyebrows, the root of the nose and the internal part of the left eyebrow. From here it advanced in a continuous course through the lower part of the whole of the right eyebrow to the temples and, by means of many splinters similar in size, so insinuated itself between the body of the eye and the socket by which the right eye is contained in the skull, that the greatest impact was sustained by the socket itself. Its lateral wall was peppered with many splinters[49] and there the lance settled, burying and concentrating itself in varying degree, which undoubtedly caused the very great concussion of the brain.

With the reception of the wound, the king was seen to roll first to one side and then to the other, but eventually managed to keep his saddle by his own efforts. When he had slipped to the ground and was surrounded by spectators running forward from the crowd, he showed a loss of consciousness, although he later ascended the steps to his chamber with hardly a totter.[50]

After some half-dozen splinters of the lance which enclosed his eye, especially on the outer side, had been avulsed from the wound by hand, he vomited his dinner and likewise, later, a small portion of the potion of rhubarb and mummy[51] which

[48] This relation written by Vesalius, probably after his return to Brussels, is known only through a sixteenth-century copy preserved in the Bibliothèque Nationale at Paris. It was a transcription of this latter manuscript which was printed by Ruble (Note 8), pp. 432-435.

[49] Two of the splinters removed from the King's orbit were illustrated, one, in a letter from Luigi de Gonzaga to the Duke of Mantua, Paris, July 1, 1559, and the other, in the correspondence of the Bishop of Fermo to the Cardinal of Naples, Paris, June 30, 1559. The larger of these measures 3¼ in. (9.5 cm.) by ⅜ in. (1 cm.), and is extremely jagged at either end. The smaller splinter is approximately 2¾ in. (7 cm.) by ⅛ in. (0.4 cm.). *Cf.* Romier (Note 4), p. 380.

[50] This statement is supported by the account of Alfonso d'Este to the Duke of Ferrara, cited from the ms. by Romier (Note 4), p. 381: "Montando la scala S. *Mtà* hà sempre mutato i piedi di grado in grado da lei medesima, sendo pero sostenuta della testa, delle braccia et del busto, monstrando cuore et vigore veramente da re."

[51] In the sixteenth century and long after, mummy was the standard ingredient in remedies used for the treatment of bruises and contusions of various kinds. The material was very expensive and great powers were ascribed to it. Its exact nature was the subject of considerable dispute. The true mummy was supposed to be the concreted mass of resinous materials and organic remains derived from the sarcophagi of Egypt, but as with so many other remedies of this nature, substitution and fraud were the general rule. The Arabs, such as Serapion and Avicenna, held that it was ambergris, others contended that it was nothing but asphalt from the bodies of the poorer people of Egypt who could not afford to be embalmed with more expensive spices. Paré is usually credited with denouncing this ancient drug although there were many others of his time who also questioned its value. Commenting on the frauds and uselessness of mummy, Paré says, "Which

had been given to him. Then again a large quantity of pituitous blood flowed from the wound, and on the same day he passed a significant amount from the anal veins. About twelve ounces were withdrawn by venesection, and a slender anti-febrile diet was instituted with trial subductions of the bowels and decoctions prepared to cool the blood and lessen its force.

A lethargy overcame him, and the king, although gravely wounded in a part of such exquisite sensibility, almost never mentioned any pain and seemed to be benumbed in both his animal and especially in his vital strength.[82] However no fever had as yet appeared. On the following days, when the wound was treated by the physicians, fibres and splinters of wood were constantly being extracted at intervals from the previously mentioned region of the eye-socket. As a result of the blow, both the bone and its membrane, in that place, were seen to be bare and rough. A consultation was held by the physicians as it was suspected that concussion of the brain and in that case, rupture of the veins, as well as the contusion from the blow on the head, were the cause of the vomiting first mentioned and the lethargy, although some of the physicians with the attendant nobles to the king himself, interpreted matters more optimistically and were unwilling to acknowledge any damage to the brain, an injury they were loathe to admit in so great a king. Nevertheless the physicians carefully considered whether the damage to the brain, if it were perhaps present, could be countered in some manner. And so they discussed the use and various methods of trephination of the skull and things which occur therein, fractures of the skull, and the nature of the blood diffused between the skull and dural membrane of the brain. Finally a general conclusion was reached, and all agreed that trephination could promise nothing.

Then, with the beginning of the fourth day, fever appeared, which, although to some seemed to indicate damage to the brain, yet by most was considered due to putrid material which in a venous type resulted from bad humours rather than from the wound or from the brain. This reasoning was based upon knowledge of the royal constitution and judgment of his urines.[83] Although purgative remedies happily thwarted the fever, delirium appeared. And so, little by little, the appearance of signs began to indicate more fully the damage to the brain and its membranes, and thus

thing sometimes moved certain of our *French* Apothecaries, men wondrous audacious and covetous, to steal by night the bodies of such as were hanged, and embalming them with salt, and drugs, they dryed them in an Oven, so to sell them thus adulterated in stead of true Mummie. Wherefore we are thus compelled both foolishly and cruelly to devour the mangled and putrid particles of the carkasses of the basest people of *Egypt*, or of such as are hanged, as though there were no other way to help or recover one bruised with a fall from a high place, than to bury man by horrid insertion in their, that is, in mans guts." Paré (Note 2), XII, vii, 314-315. Matthiolus, *Dioscorides* (Venetijs, 1558), LXXV, 88-89.

[82] In the humoral doctrine there were three fundamental spirits or pneumata: natural, vital, and animal. The natural spirit was elaborated in conjunction with the chyle from the alimentary tract, in the liver. From here it was carried by means of the veins to the several organs in order to assist in the concoction of the nourishment utilized by the tissues. Some of this spirit passed to the left heart where it met with the pneuma drawn in by the lungs and was still further refined into the vital spirit. The vital spirit was in turn carried by the carotid vessels to the brain where it was transformed into a still higher form of ethereal substance called the animal spirit. The force, strength, or faculty of these spirits provided, so to speak, the motive power for metabolism, cardiovascular, and nervous system function, respectively.

[83] "Hà urinato, et gli medici, che conoscono la loro complessione, dicorno che veramente la urina è un pocho alterata, ma che sole nella sua bona sanità farne di simili, non lasciando pero di dire che dopoi la botta hauta finhora il polso è stato un pocho alterato, pero come niente." Letter of Gonzaga, cited by Romier (Note 4), p. 384.

any slender hope of assistance evaporated. With the daily and unquestionable increase of the delirium, the appearance of obvious signs, and irregular sweats and rigors, both of which were frequent, we saw that the injuries to the sutures and wounds of the head were going to be fatal.

I do not wish to speak here more prolixly than care requires. The wound gaped on all sides and was favourable for the shedding of osseous squames [sequestra] and the splinters of wood, and consideration was given to the remedies which had been applied to the serous swellings of the eye and eyebrows. I shall only add those things which were observed after the death of the king.

Despite the fact that the left eye was immensely swollen, vision was intact, so that he was not otherwise affected by a solution of continuity. The bone of the skull in the frontal region appeared to be everywhere uninjured and intact, although there was an oedematous swelling of the forehead. The superior part of the nasal bone was not at all bare and had suffered from contusion rather than being bared by attrition. The external side of the socket of the right eye was completely denuded of membrane and was rough. Its innermost and posterior aspect still contained a large quantity of wood which, like stakes, had been driven, as it were, in a circle, so that the greater part of it occupied a position between the socket and the lower aspect of the eye. By their apices they penetrated the hard covering of the eye so that small pieces extended as far as the superior part of the socket and anterior region of the eye, which otherwise in content and appearance seemed uninjured and intact.

The membranes of the brain and the brain itself at the forehead and at the right socket of the eye, which under any other circumstances one would have believed to be preternaturally preserved, appeared quite unharmed and the dural membrane seemed everywhere uninjured. But at the vertex somewhat posteriorly, the left part of the brain which is bounded to the right, together with the thin membrane attached to it, possessed a yellow colour for the length of one finger and the width of two and was putrid and had suppurated straight down to the depth of a thumb. The whole of the left part was observed filled with a serous ichor-like fluid which flowed away not otherwise than if the whole had been recently caused by putrefaction or some sort of gangrene.

In the region where the suppuration occurred, the dural membrane was observed as having vessels which were more distended and blackish than elsewhere, but between this structure and the skull there was some grumous blood. The skull and the skin, which, as may already be conjectured, that is to say, had been scraped off, showed nothing abnormal, although at some time as a scar indicated, a wound of the king had been infected. And so this putrid condition gave proof that the brain had collided with the skull and was concussed and shocked by it, and not that the condition was caused by an injury to the skull.

It should not be omitted that the left leg and arm showed before death a left paralysis while a convulsion of long duration was plainly observed on the whole right side. Never again did vomiting occur, and again and again only a rattling in the throat was audible. Towards the end respiration was very difficult, and on observation it was clear that the left side of the thorax yielded with difficulty.

Death occurred on Monday in the first hour of the afternoon, that is to say, on the eleventh day, and it had been accelerated for the reason that, at the persuasion of some of the nobles, the king had been given some wine to which sage with some

very strong calefacients had been added; a prescription which had been prepared as a potion for wounds. This had increased the necessity for strong respiration.
—Andreas Vesalius of Brussels.

From the account of Andreas Vesalius and other contemporary reports, we obtain a classical picture of cerebral compression supervening on concussion following a contre-coup injury to the brain and subdural haemorrhage. The initial vomiting and restlessness, the gradual loss of consciousness, the slow pulse, stertorous breathing and rise of temperature, and finally the focal symptoms of spasmodic jerkings and paralysis, presaged a fatal issue which could not be long delayed. The test employed by Vesalius, as described by Henricpetri, would seem to have been an original but somewhat severe method of eliciting the head flexion sign used in the diagnosis of meningitis and is, so far as we are aware, the first test of this nature to be described. The question as to whether the brain could be injured without a frank fracture of the skull was, in the sixteenth century, a matter of considerable dispute, and no doubt the reason why trephination, which might have offered a slim chance of success, was not employed on this occasion. It is therefore of great interest that not only does Vesalius emphasize in his report that the autopsy proved that cerebral injury does occur by such a mechanism, but Ambroise Paré specifically cites this case to re-establish and uphold once again the truth of ancient Hippocratic observation. There are minor discrepancies to be found in the versions of Paré and of Vesalius, but these may be excused in the former, as a lapse of memory from the passage of several years, and in the latter, from the very obvious hastiness of construction of the report.

It is to Vesalius we owe the introduction of observational science. He had long appreciated the importance of systematic examination of morbid lesions and the necessity of following the progress of disease to its termination in order to understand the pathological process. In this connection, more than a dozen years before, he had written, "I think I shall never fail to seize the opportunity of examining any bodies which are brought to my attention."[54]

[54] Vesalius (Note 7), p. 176.

Sir Thomas Browne's Scientific Quest

E. S. MERTON*

WITH WHAT charts does Sir Thomas Browne, as seventeenth century physician and scholar, embark upon the quest for truth, the mysterious goal of all learning and science? Specifically, what scientific method emerges from the *Pseudodoxia,* the ripe product of all Browne's scientific activity? The question is ultimately one of epistemology: What is Browne's diagnosis of those diseases of the mind which impede the attainment of truth, and what is his prescription?

What is truth? said jesting Pilate; and would not stay for an answer. Sir Thomas Browne in a sense stayed all his life for an answer. Though the nature of truth be doubtful, though it be "Janus-faced" and like the Delphian sword will cut on two sides, though it be "that obscured Virgin half out of the Pit," its quest is for Browne the characteristic occupation of man. The quest in its larger aspect exercises all the faculties of man, his sense and his reason, his faith and his imagination. It is an adventure in both science and religion, by the former exploring the world of nature, by the latter approaching the City of Heaven. The scientist etches a visible picture of that invisible reality which is enjoyed by the mystic. The "hieroglyphs" of nature, when grasped by sense and interpreted by reason, can lead to an imaginative reconstruction of the articles of faith. Hence Browne's insistence upon scientific method—the disciplining of sense and reason—which here concerns us. Hence his condemnation of those "sedentary curiosities" who, though "constellated unto knowledge," rest in doubt of things which may be verified, and thus fail "in the intention of man it self."[1] Early in his life Browne fell in love with that obscured virgin half out of the pit, and she remained his ruling passion to the end. The pure, Hellenic love of truth is the stimulus for all Browne's intellectual activity.

The scientific exploration of truth occupies two phases: first the obstacles to its quest must be recognized, the causes of human error must be analyzed; and, second, a definite procedure for its attainment

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[1] *The Works of Sir Thomas Browne,* ed. by Geoffrey Keynes (6 vols., London, Faber and Gwyer, 1928-31), I, 123; II, 40-1.

must be followed. Both these phases were being studied in Browne's day. Bacon, we know, had been much concerned with them. Regarding the first, Bacon had in the *Advancement of Learning* discussed the "peccant humors," the "diseases" of the mind; in the *De Augmentis* he had discussed "fallacies"; and especially in the *Novum Organum* he had described strikingly the "idols of the human mind."[2] This description of the idols, perhaps the best known part of the *Novum Organum,* has commonly, and hastily, been taken as the basis for Browne's analysis of the causes of error.[3] A comparison between Bacon's idols and Browne's causes should, therefore, elucidate the nature of Browne's diagnosis and measure the extent of its debt to Bacon.

Bacon's idols are four in number: idols of the tribe, of the cave, of the market place, and of the theatre. *The Idols of the Tribe* refer to the innate weakness of the understanding in the very tribe or race of men. They include man's tendency to take his sense as the measure of things, to believe positive assertions more often than negative, to feign parallels and similitudes where none exist, to rationalize beliefs that are already held, to be unduly influenced by sudden and simultaneous impressions. *The Idols of the Cave* refer to the weaknesses in mental equipment or in education of the individual, whose vision is blunted by circumstances peculiar to him, as was that of Plato's cave dwellers. These idols include the individual's tendency to view truth from only his specialized field, to notice differences rather than resemblances or resemblances rather than differences, to stress antiquity or modernity, to reverence particular authorities. *The Idols of the Market-place* refer to the association of words with things and are "the most troublesome of all." The problem here is one of semantics. As abstractions, words may be false in two ways: they may be names for things which do not exist; or they may be erroneous names for things which do exist. Of the former kind Bacon gives abstractions like "Fortune," "the Prime Mover," "Planetary Orbits," "Element of Fire"; of the latter kind he gives an abstraction like "humid," which is

[2] *Adv.*, Bk. I (*The Works of Francis Bacon*, ed. by Spedding, Ellis, and Heath, London, 1889), III, 284-95; *Nov. Org.*, Bk. I, Aphorisms 38-70, Spedding, IV, 53-72; *De Aug.*, V, 4, Spedding, IV, 430.

[3] Among recent writers, *cf.* Almonte C. Howell, "Sir Thomas Browne and Seventeenth Century Scientific Thought," *Studies in Philology*, 22, 61f.; Alwin Thaler, "Sir Thomas Browne and the Elizabethans," *Studies in Philology*, 28, 110f.; Gordon K. Chalmers, "Sir Thomas Browne, True Scientist," *Osiris* 2, 38f.; Sir Basil Willey, *The Seventeenth Century Background* (London, 1934), 52f. Although the assumption of Browne's indebtedness to Bacon is generally made, there is by no means agreement on which of Bacon's idols to assign to which of Browne's causes.

"nothing else than a mark loosely and confusedly applied to denote a variety of actions which will not bear to be reduced to any constant meaning. For it both signifies that which easily spreads itself round any other body; and that which in itself is indeterminate and cannot solidize. . ."[4] Bacon mentions levels of abstraction, from the lowest level, consisting of names of substances like "chalk" and "mud" about whose referents there is no doubt, through a more faulty level—names of action like "to generate," "to corrupt," "to alter"—to the most faulty level—names of quality like "heavy," "light," "dense," "rare." *The Idols of the Theatre* refer to misconceptions of truth arising from false systems of philosophy or from perverse rules of demonstration: "all the received systems are but so many stage-plays, representing worlds of their own creation after an unreal and scenic fashion."[5] The general fault of all these systems is that of hasty induction from too few instances. Three schools of philosophy are criticized: (1) the Rational or Sophistic, which snatches from experience a few common instances and leaves all the rest to "agitation of wit"—a school represented by Aristotle; (2) the Empirical, which educes a system from a few experiments and wrests all other facts "in a strange fashion to conformity therewith"—a school represented by the Alchemists and by Gilbert; (3) the Superstitious, which mixes its philosophy with theology, abstract forms, final causes, and first causes—a school represented by Pythagoras and Plato.

Let us now examine Browne's causes of error. Browne discusses six general causes: the common infirmity of human nature, the erroneous disposition of the people, credulity, supinity, adherence to authority and antiquity, and the endeavors of Satan. If this is a version of Bacon's idols, it is certainly a garbled one. A loose parallel, and *the only one at all between the two analyses,* may be drawn between Bacon's *Idols of the Tribe* and Browne's *common infirmity of human nature.* However, where Bacon analyzed the innate weaknesses of the human mind, Browne discusses the deception of our first parents (by Satan, by one another, by their senses, by their misapprehension of God's command) and various "erroneous conceptions" in "the relations of Scripture before the Flood."[6] *Browne does not discuss the innate weaknesses of the human mind which Bacon listed under his Idols of the Tribe.* Under *the erroneous disposition of the people* Browne treats of weaknesses peculiar not to man-

[4] *Nov. Org.*, I, ix, Spedding, IV, 61-2.
[5] *Nov. Org.*, I, xliv, Spedding, IV, 55.
[6] II, 20.

kind at large, but to "the most deceptible part of mankind,"[7] the vulgar, *a distinction which finds place in none of Bacon's idols.* The principal weakness here is the domination in the vulgar of the higher faculties by the lower, of the understanding by sense and passion. The understanding "submitteth to the fallacies of sense, and is unable to rectify the Error of its sensations." Thus the vulgar conceive the earth bigger than the sun, the fixed stars smaller than the moon; to them rhetoric appeals more than logic, parables and proverbs more than propositions and demonstrations; they are deceived by priests, physicians, astrologers, fortune tellers, and politicians. As an aspect of the erroneous disposition of the people, Browne also discusses fallacies, which he divides into verbal and real: (1) The verbal fallacy is a literal interpretation of a metaphor. Thus Pythagoras' injunction to his disciples to abstain from beans was not a dietary but a political one, an injunction against holding office, "for by beans was the Magistrate elected in some parts of Greece." Under this verbal fallacy, or "fallacy of Equivocation," are comprehended "all deductions from Metaphors, Parables, Allegories unto real and rigid interpretations."[8] It will be seen that *Browne here is not,* as has been claimed, *concerned with Bacon's Idols of the Marketplace,* the semantic problem, which Bacon's brilliant insight pierced, of the inadequate reference of abstract words to the things they are supposed to name.[9] (2) Browne's real fallacies are four in number, all common fallacies of Aristotelian logic: argument from a false premise, argument from a partially false premise,[10] false argument from cause to effect, and false argument from effect to cause.

[7] II, 24f.

[8] II, 33; II, 34. Cf. II, 205-6.

[9] Browne is aware of the semantic problem which Bacon treats in the *Idols of the Marketplace,* though Browne does not consider it one of the causes of error. In discussing the nature of devils, he makes a passing reference to this problem. The devils, he says, make use "of moral and Logical verities; that is, whether in the conformity of words unto things, or things unto their own conceptions, they practise truth in common among themselves" (II,84).

[10] This fallacy does somewhat resemble the general fault of hasty induction from too few instances which Bacon criticizes in many places, among them in his *Idols of the Theatre,* where he accuses philosophical systems of it. Browne's words are: "This fallacy men commit when they argue from a particular to a general; as when we conclude the vices or qualities of a few upon a whole nation. Or from a part unto the whole . . . or from the sign to the thing signified," as in idolatry (III, 35-6). However, the similarity ends here. Browne does not discuss Bacon's main topic, philosophical systems as falsifications of fact. Browne's debt, if any, therefore is, as usual, a most general one, not to a specific passage in Bacon but to Bacon's underlying principle of method for his instauration of the sciences. Nor, need it hardly be added, are Browne's four real fallacies four *Idols of the Theatre,* as one critic claims. (Chalmers, *op. cit.* 43.) Howell, *op. cit.* 63f., curiously, omits the *Idols of the Theatre* altogether from his discussion of the influence of Bacon's idols on Browne's causes of error.

Browne's other causes of error are almost self-explanatory. The third is a very general one, *credulity,* "a weakness in the understanding . . . whereby men often swallow falsities for truths. . . ." As a weakness of understanding it resembles the preceding cause, except that it appears in "wiser brains" as well as "vulgar heads"; it is exemplified in pagan religious beliefs. The fourth cause is *supinity,* a neglect of observation, certainly a Baconian viewpoint, but not a Baconian idol. The fifth cause is "the mortallest enemy unto Knowledge," *adherence to antiquity and authority.* It is the "resignation of our judgments," and is of course intimately connected with the preceding cause, supinity or "neglect of Enquiry." To it Browne devotes more attention than to any other cause, reflecting the attitude of the new Baconian science, of the moderns against the ancients. He analyzes the weaknesses of antiquity (its false doctrines, reliance on fables, commonplace sayings), illustrates the insufficiency of authority as proof in the sciences, and enumerates the authors responsible for the tradition of error, there being "scarce any tradition or popular error but stands also delivered by some good author."

Browne's last cause of error is the *endeavors of Satan.* Satan deludes man in five main points: he instills the beliefs that there is no God, that there are many gods, that he himself is God, that artificial magic may charm him or counteract his power, and that he does not exist at all. In addition Satan inclines us to reliance on magic, to a belief in astrology, in auguries and divinations, in charms, amulets, and other occult cures for diseases, in speculative delusions (as that the sun, moon, and stars are living creatures, that spirits are corporeal, that the female sex have no generative emission), and, finally, he hunts after "simple lapses," as that there is another world in the moon or that the sun is no bigger than it appears.[11]

A comparison of the two analyses can lead only to the conclusion that Bacon's idols had become dim in Browne's memory, if they existed there at all, when he wrote on the causes of error in the first book of the *Pseudodoxia.* We may note that Browne nowhere mentions the idols in his discussion and that his general classification and individual descriptions are unlike Bacon's. Thus we have already noticed (1) the weakness of the parallel between Bacon's *Idols of the Tribe* and Browne's *common infirmity of human nature,* (2) the absence in Bacon of Browne's

[11] II, 38; II, 39f; II, 42-68; II, 68-77.

second cause, *the erroneous disposition of the people,* and (3) the difference between Bacon's *Idols of the Market-place* and Browne's verbal fallacies, both of which, on the surface, treat of words. Of Browne's other causes—*credulity, supinity,* and *adherence to authority and antiquity,* and *the endeavors of Satan,* only one, *adherence to authority and antiquity,* offers any analogy to the idols, and that is to a passing remark by Bacon on a favorite subject—the superiority of the moderns to the ancients—a subject which Bacon more amply and pointedly treats elsewhere.[12]

Browne's diagnosis of the causes of error can be termed Baconian only in the loosest sense. It should not be taken, as it has commonly been taken, as a version, perhaps somewhat muddled, of Bacon's idols. Its debt is not a specific one to Bacon[13] but rather a general one to that new experimental philosophy which Bacon so forcibly echoed. Browne reflects those ideals—the need for observation and for the inductive method, the attack on authority and antiquity—which are fundamental to and pervasive in all Bacon's treatment of the sciences, ideals which are not limited to, or especially significant in, Bacon's treatment of the idols. Furthermore, they are ideas pervasive not only in Bacon but in the general climate of opinion to which Browne, as well as Bacon, was so responsive. They are ideals which had been practised before Bacon was born.[14] Browne's diagnosis of the causes of error is Baconian only in the sense that it shares the popular scientific attitudes which became identified with Bacon's name. In its details of description and classification, as an

[12] Bacon says the *Idols of the Cave* "grow for the most part either out of the predominance of a favorite subject, or out of an excessive tendency to compare or to distinguish, or out of partiality for particular ages, or out of the largeness or minuteness of the object contemplated" (*Nov. Org.,* I, lviii, Spedding, IV, 60).

[13] The analysis of causes of intellectual error is a favorite topic not only of Bacon and Browne but of their contemporaries as well. Lord Herbert of Cherbury published his *De Causis Errorum* in 1645, the year before the appearance of the *Pseudodoxia.* And Joseph Glanvill, who was as responsive to the intellectual currents of his time as anyone, published in 1661 his *Vanity of Dogmatizing,* which is "a Discourse of the Shortness and Uncertainty of our Knowledge, and its Causes" (*The Vanity of Dogmatizing,* Facsimile Text Society, New York 1931, title page.) Glanvill's analysis offers an interesting comparison to those of Bacon and Browne. As causes of error he lists the Fall, the difficulty of attaining truth, the deception of our senses, the deception of our imagination, the precipitancy of our understandings to hasty conclusions, and the influence of our "affections"—such as love, custom, interest, love for our own productions, reverence to antiquity and authority—on our understanding and judgment. Glanvill's analysis is often more penetrating than that of either Bacon or Browne, both of which it so closely resembles. The point here suggested is that *The Vanity of Dogmatizing* is the product of a tradition to which both Bacon and Browne contributed, but which Bacon did not necessarily originate in his striking metaphor of the idols.

[14] See note 19, below.

original synthesis, it is as native to Browne as the idols themselves are to Bacon. Like Bacon's, it is an independent, if less brilliant, critique by a modern scientist of the causes of ancient error.

Having, in the first book of the *Pseudodoxia,* cleared the obstacles to the quest for truth, Browne thereafter illustrates his program, what may loosely be called his "scientific method." From his diagnosis of the causes of error we are led naturally to his prescription. The prescription can indeed be elicited from the diagnosis: *experience,* as against the neglect of observation and experiment due to supinity; and *reason,* as against the common infirmity of human nature and the erroneous disposition of the people. *Authority* is sometimes included as a poor third in this list. Although Browne refers to "the three Determinators of Truth, Authority, Sense, and Reason," and although he certainly depends upon authority in practice, his more usual references are to experience and reason alone as the guides to truth.[15]

In Browne's scientific method the eclecticism which characterizes all his work is again apparent. To put it simply, his use of experience and reason associates him with the moderns; his use of authority, with the ancients. It is significant that he subordinates the latter to the two former. He thinks of himself as a modern. "There is nothing more acceptable to the Ingenious World," he had observed, "than this noble Eluctation of Truth, wherein, against the tenacity of Prejudice and Prescription, this Century now prevaileth."[16] His use of experiment and of reason relates him to Bacon and to Descartes. In spite of their fundamental differences, both Bacon and Descartes were moderns, opposed to the scholastic tradition, ambitious to make man master of nature, and looking forward to a new order of knowledge. Browne's relation to them is symbolical rather than literal. They are the symbols of two great modern schools of thought, the empirical and the rationalistic. In Browne, sensitive as he was to the intellectual climate of his day, we see the early stirrings of these two schools. He is probably not indebted directly to either philosopher. We have seen that in his analysis of the causes of error Browne was a Baconian rather than a direct imitator of Bacon.

[15] II, 195. See II, 304; II, 64; II, 40. While "Experiment by sense" and "Enquiry by reason" are main guides in science, faith and authority predominate over reason and sense for Browne in matters of religion. See I, 115; III, 328-30.

[16] I, 123-24.

We shall see that in his use of experience and reason, the explanation by source ascription to Bacon and Descartes is again too simple.[17]

In the very first aphorism of the *Novum Organum,* Bacon states that man "can do and understand so much and so much only as he has observed in fact or in thought of the course of nature; beyond this he neither knows anything nor can do anything." With this sentiment Browne is in complete agreement. For him the test of experience is the most important one of all. The "sense of man" is "the definitive confirmator and test of things uncertain"; "sense and Observation," he emphasizes, "seems to me the surest path, to trace the Labyrinth of truth."[18] As the great age of the new science, the seventeenth century saw the appearance of "philosophical instruments." Bacon had enjoined the use of devices to supply the shortcomings of sense and to correct its deceptions. Browne was one of the first to make good use of "exquisite Microscopes." His scientific experiences—his random empiricism and his controlled experiments—are as diverse as his interests.

Browne's "doctrine of experiment" could have stemmed from Bacon; it could also have stemmed from a long tradition antedating Bacon. William Harvey, Galileo, Gilbert, and Vesalius had followed a tradition of revolt against authority, of observation of nature, and of cooperative research.[19] Indeed Aristotle himself could well have been Browne's preceptor, Aristotle, whom Browne describes as a "fellow Enquirer" of truth, with the moderns.[20] In the history of the inductive method, Aristotle's name precedes Bacon's. Actual observation formed the basis of all Aristotle's biological work, in obvious contrast to the direct intuition of Plato, who, as in the cave myth, denied that true knowledge could be based on observation by the senses. Not only in Bacon and Descartes, but in Aristotle and Plato, not to mention medieval and Renaissance authors, Browne could have found champions of experience and of reason. The medieval tradition of experimental science has been amply documented.[21] During

[17] Such an explanation is made, for example, by Howell (*op. cit.*; see note 3, 78-79) who prints passages from Browne and Bacon and from Browne and Descartes to prove that Browne was "an ardent disciple of Bacon and Descartes, making careful use of their philosophical ideas in his studies."

[18] II, 219; IV, 124. Cf. II, 101.

[19] Francis Johnson, *Astronomical Thought in Renaissance England,* shows how these "Baconian" ideals were practised over a hundred years before the Royal Society was founded.

[20] I, 124.

[21] See Lynn Thorndike, *The History of Magic and Experimental Science.* We might note that the most important portion of Roger Bacon's *Opus Majus,* the sixth part, deals with experimental science.

the later middle ages Aristotelian logic served as the basis from which modern scientific method was developed. The center of this activity, moreover, was the school of Padua,[22] at which Browne himself had studied. The traditionalism of the "determinators" of experience and reason is well attested by Alexander Ross, a traditionalist if ever there was one. In defending the ancient belief of spontaneous generation against Browne's skepticism, Ross remarks that "to question this is to question reason, sense, and experience."[23] The tradition of scientific observation and experiment was there long before Bacon's magnificent popularization, a tradition with which Browne has many ties. In his use of experience, Browne is Baconian again only in the loosest sense.

When Browne designated reason as a guide to truth, he was following, not Descartes necessarily, but an old convention. Long after the Greek ideal of *nous, ratio* and *auctoritas* were the epistemological guides of the schoolmen, who sought by reason to confirm the doctrines based on authority. Indeed it was as a revolt against medieval rationalism that the new science set up its new empirical ideal. But the intuitive reason of rationalistic tradition lingered on in the seventeenth century, was indeed vitalized in the modern rationalism of which Descartes is taken to be the first great representative. The new science did not substitute experience for reason; rather it added experience as another instrument, with reason, in the quest for truth. Even Bacon, in his division of knowledge according to the three faculties of the human soul, makes philosophy the product of reason, as are history of memory, and poetry of imagination. Boyle and Glanvill both use "reason" for the discovery of truth. Browne reflects both the rationalists' and the empiricists' use of "reason." It is often difficult, as a consequence, to determine his precise meaning for the term. Usually it refers to the exercise of the rational or "animal" faculty of the old psychology. As one of the three determinators of truth, it has three distinct applications: to the exercise of the rational faculty in logic, to the correction by the rational faculty of the errors of sense, and to Browne's own assumptions.

The exercise of the rational faculty in logic Browne describes quite clearly. Speech, he says, is at first an imitation of sounds; "men do speak in some kind but like Parrots, and as they are instructed, that is, in simple

[22] See J. H. Randall, Jr., "Scientific Method in the School of Padua," *Jour. Hist. Ideas* I, 177ff.

[23] Quoted by L. R. Wheeler, *Vitalism* (London, Witherby, 1939) 89.

terms and words, expressing the open notions of things, which the second act of Reason compoundeth into propositions, and the last into Syllogism and Forms of ratiocination." The applications of logic Browne discussed in connection with fallacies, real and verbal. These fallacies, the literal interpretation of metaphors, false causal connections, arguments from false or partially false premises, he illustrates often in his discussions of vulgar errors. Thus verbal fallacies have given rise to the error that Jews stink, "upon the villany of that fact [the crucifixion] which made them abominable and stink in the nostrils of all Men," and to the story of Romulus and Remus, the name of whose nurse was Lupa, or "wolf." Fallacies of causal connection are illustrated in false inferences and false analogies, as that an ostrich digests iron because it swallows it ("which is an inference not to be admitted, as being a fallacy of the consequent, that is, concluding a position of the consequent from the position of the antecedent"), and that all land animals resemble all sea animals, like the dog-fish, sea-horse, etc. ("Now if from a similitude in some, it be reasonable to infer a correspondence in all, we may draw this analogy of animals upon plants," and even upon minerals.")[24]

The correction by the rational faculty of the errors of sense was the cure suggested for Browne's second cause of vulgar errors, the erroneous disposition of the people. This erroneous disposition arose from "a false judgment of things." The understanding of the vulgar "submitteth to the fallacies of sense, and is unable to rectify the Error of its sensations." And so they conceive the earth bigger than the sun and the stars smaller than the moon. Reason must correct experience. We must be careful here to distinguish the skepticism of Browne from that of Descartes. Though he is aware of the limitations of the senses, Browne does not reject their evidence in favor of the intuition of clear and distinct ideas. He regards sense and reason as closely allied; both together point the way to truth. "Joyn Sense unto Reason, and Experiment unto Speculation," he says, "and so give life unto Embryon Truths, and Verities yet in their Chaos." He recognizes, though with some reservations, the dependence of the rational soul upon the human body, and hence of reason upon the senses. For the action of the soul, he says, there "is required not onely a symmetry and proper disposition of Organs, but a Crasis and temper correspondent to its operations: yet is not this mass of flesh and visible

[24] III, 162, II, 32f., III, 46-47; II, 205-6; II, 269; II, 278-79.

structure the instrument and proper corps of the soul, but rather of Sense, and that the hand of Reason."[25] When, therefore, Browne emphasizes the fallacies of sense, he is not necessarily following the Cartesian skepticism which rejects the senses as a guide to truth. The deceptiveness of the senses was recognized by empiricists as well as by rationalists. It is fundamental to Galileo's differentiation between primary and secondary qualities. It is clearly emphasized by Bacon. "But by far the greatest hindrance and aberration of the human understanding," says Bacon, "proceeds from the dulness, incompetency, and deceptions of the senses; in that things which strike the sense outweigh things which do not immediately strike it, though they be more important." Hence it is that "speculation commonly ceases where sight ceases; insomuch that of things invisible there is little or no observation."[26] Boyle is even more explicit in his reliance on reason as the ultimate criterion of truth. "Experience is but an assistant to reason," Boyle observes, "since it doth indeed supply information to the understanding, but the understanding still remains judge, and has the power or right to examine and make use of the testimonies that are presented to it."[27] For Browne too sense is "the hand of Reason." Reason acts upon experimental data and arrives at a finer perception of truth than that furnished by the senses. Thus Browne remarks that "our clearest waters and such as seem simple unto sense, are much compounded unto reason"; this is experimentally shown when water is evaporated and found to contain a residue of salt, earth, and other materials. "The rationall discovery of things transcends their simple detections," as the discovery of the law of planetary motion is superior to that of the Indies and as he had told Henry Power that he preferred the discovery of Harvey to that of Columbus.[28]

Browne's conception of reason differs, then, from that of Descartes on the crucial point of its relation to sense. He cannot follow through to Descartes' ideal method of mathematical deduction from self-evident prin-

[25] II, 25; I, 123-24; I, 46.

[26] *Nov. Org.*, I, 1, Spedding, IV, 58.

[27] *Works*, ed. Thomas Birch (London 1672) V. 539. Boyle continues "The outward senses are but the instruments of the soul . . . the sensories may deceive us . . . it is the part of reason, not sense, to judge whether none of the requisites of sense be wanting . . . and also it is the part of reason to judge what conclusions may, and what cannot, be safely grounded on the information of the senses and the testimony of experience. So when it is said that experience corrects reason, it is somewhat an improper way of speaking: since it is reason itself that upon the information of experience, corrects the judgments she had made before."

[28] II, 264-5; V, 244-45; VI, 277. Cf. II, 18-19, where Browne explains the Fall as due to the deception and overpowering of reason by the senses.

ciples, proceeding from causes to effects, a deductive method apparent even in Descartes' work on physiology, *De l'homme.* As with Bacon and Boyle, Browne's ideal method is inductive, proceeding from particulars. His application of reason for the correction, by the rational faculty, of the errors of sense reflects the empiricists' use of the term. Yet Browne is ever eclectic. One other application of the term "reason" does ally him with the rationalistic philosophy and the deductive method which Bacon condemns in his Idol of the Theatre. It is the imposition of "reason," *as synonymous with Browne's own a priori assumptions,* upon his scientific material. Rather than with Descartes' "clear and distinct ideas," however, this application would seem more akin to Herbert of Cherbury's "common notions." "For reason being the very root of our natures, and the principles thereof common to all," Browne says, "what is against the Laws of true reason, or the unerring understanding of any one, if rightly apprehended, must be disclaimed by all Nations, and rejected even by mankind." Herbert's "common notions" and his criterion of truth as universal consent seem to be here reflected.[29]

Whatever its source, this application of "reason," the test of truth by the deductive method, is most frequent in the *Pseudodoxia.* It is frequent because so often errors contradict what is for Browne the "reasonable" order of nature. One of his most fundamental assumptions, one related to the Greek concept of *nous,* is that the law of nature and the law of reason are identical, both being manifestations—the one in nature, the other in man—of that Reason of God in which the whole creation participates. To go against the natural order is therefore to go against reason and the will of God; it is to go against Browne's assumptions. Thus it is "repugnant unto Reason" that lampries should have nine eyes, because of "the monstrosity they fasten unto Nature," the superfluity of more than two eyes in one plane. Thus it "will not consist with reason" that the female viper in the act of generation should bite off the head of the male, an error "injurious to the providence of Nature, to ordain a way of production which should destroy the producer." And so generally any occult quality, one operating not by natural but by hidden causes, "contemns the law of Reason, and defends itself by admitting no reason at all."[30] In all these cases the error is a special case which violates a

[29] II, 52. Herbert's *De Veritate* would have been available to Browne before the appearance, in 1646, of the *Pseudodoxia.* Editions of Herbert's book appeared in 1624, 1643, and 1645.

[30] II, 254; II, 237; II, 268.

general assumption, a "common principle," of Browne's, and so contradicts the law of reason.

The eclecticism so characteristic of Browne has been apparent in all these meanings and uses of "reason" in his scientific method. Browne does not cry from the house tops, as did Bacon, the liberating power of experience in opposition to the sterilizing influence of reason. Nor does he guarantee, as did Descartes, the intuitive truth of reason as opposed to the falsity of the senses. Unlike either, he follows both sense experience and *a priori* reason in his quest for truth. He uses what comes to him from tradition and from contemporary science, often, perhaps, without too precise a formulation.

The doctrine of "authority" is as old as the profession of the witch doctor. It was certainly an established, not to say mandatory, principle with the schoolmen. The progress of the great Enlightenment is associated with its demise, at least in theory. By Browne's time it had come to play a minor part in the search for truth. On this account it occupies an anomalous position among Browne's three determinators. It is the only one he both attacks and follows; it is the only one for which we must distinguish between his theory and his practice.

Authority was the target of Browne's heaviest attack in his analysis of the causes of error. Dependence upon authority is "the mortallest enemy unto Knowledge," involving a "resignation of our judgments." He points out the fallibility of the authorities themselves, evinced in their refutations of one another and in their credulity. Compared with reason and experience, authorities offer but "a weaker kind of proof," fit for immature minds. Upon intellectual maturity "we become emancipated from testimonial engagements, and are to erect upon the surer base of reason." If authorities are "neither consonant unto reason, nor correspondent unto experiment, their affirmations are to us no axioms." Browne's delight in displaying his opposition to authority is beautifully illustrated in two versions of his chapter "Of Snayles" in the *Pseudodoxia,* the later of which dramatically reverses his earlier opinion that snails have no eyes. He started the earlier version by contradicting authorities who held that snails do have eyes, and when he came round to the opposite opinion in the next edition, one would suppose he would then record his agreement with those same authorities. Instead, where the first edition states, "That Snayls have two eyes . . . is the opinion of some learned men," which he proceeds to contradict, the later edition states, "Whether Snayls have

eyes some Learned men have doubted," which he again proceeds to contradict.[31]

Browne however does not always practise his precept of "omitting the authority of others, as the doctrine of Experiment hath informed us," or stand alone to meet "the Goliah and giant of Authority" with arguments "drawn from the scrip and slender stock of our selves." The *auctoritas* of scholastic and humanistic tradition still bound him. That is why the *Pseudodoxia* is like an encyclopedia of traditional learning. The authorities are used as often for purposes of confirmation as for those of confutation. Often Browne gathers together all that they say on a particular question and lets that stand as evidence. Sometimes his dependence is explicitly stated. He is not above following an authority in the most scandalous beliefs, from which his scientific training should have protected him. Thus he believes in the magical cure by music of the bite of the tarantula, "since the learned Kircherus hath positively averred it, and set down the songs and tunes solemnly used for it."[32]

Browne's dependence upon authority is often rationalized, as we should say. He equates its legitimacy with that of "reason" (as when he remarks it "were no injury to reason" to question the medicinal virtues of the unicorn's horn, since the "Ancients ascribed no such virtue to it"). More frequently he equates it with "experience"; the validity of an authority is that authority's experience. Concerning the error that the salamander is able to live in flames, he thus observes, "there is on the negative Authority and Experience." After listing a number of writers, he gives "experimental conviction": "Mathiolus observeth," he says, "a Salamander burnt in a very short time."[33] Browne's constant dependence upon naturalists like Gesner, Aldrovandi, Belon, Rondelet, in addition to Aristotle, is best explained on this basis. Indeed the equation between authority and experience is for him usually a very just one; he is habitually checking one against the other.

It may be interesting to illustrate how Browne applies his threefold scientific method in the case of a particular error. His typical procedure in organizing a chapter of the *Pseudodoxia* is to state the error, to name authorities *pro* and *con,* to apply any or all of the three tests of truth, and to give the "grounds" of the error, sometimes rounding off with other lore on the subject. Let us take his chapter on the badger.[34] He finds the

[31] II, 42; II, 50; II, 56; II, 55.
[32] II, 137; II, 5-6; II, 365.
[33] II, 275-6; II, 231.
[34] II, 195-6.

belief that the badger's legs are shorter on one side "repugnant unto the three Determinators of Truth, Authority, Sense and Reason." Albertus Magnus speaks dubiously of its verity and Aldrovandus plainly affirms there can be no such inequality observed. In his own experience he could not discover this difference. The "affront to Reason" affords in this case the most extensive argument. It is an affront to one of Browne's cherished assumptions: such an inequality would be "generally repugnant unto the course of Nature." This course of nature he illustrates from Aristotle and from his own minute observation of geometrical proportions in animal locomotive organs. (Authority and experience are here thus brought to the aid of reason.) Lastly, he concludes, the monstrosity is ill contrived, to affix two shorter legs on the same side: since quadrupeds move by cross legs, it would have been less absurd to make a pair of these shorter and thus preserve their equality. Thus by reading, observation, and thinking; by authority, experience, and reason, Browne attempted "the noble Eluctation of Truth," which he had held up as the whole duty of man. Not always is his organization so compact as in the chapter on the badger. But always he uses his Determinators in an intellectual quest to expose the pitfalls of human error. Browne's quest for truth, his prescription of scientific method, is complementary to his diagnosis of the diseases of the mind.

Some Medical Bibliophiles and Their Libraries

W. J. BISHOP*

MEDICAL men are no more exempt from bibliomania than from other diseases, and in studying the history of this malady we find that many of its most eminent victims have been members of the medical profession. The roll of medical bibliophiles, a long and glorious one, contains the names of some who occupy a high place in the history of medicine by virtue of their achievements in the art and of others whose sole claim to remembrance is their devotion to the collection and preservation of books.

According to Dibdin[1] the term "bibliomania" was coined by Dr. John Ferriar (1761-1815), and this famous Manchester physician is said to have been the first to recognize the disease as a clinical entity. John Ferriar was a pioneer in public health and sanitation and the author of a valuable book of clinical records entitled *Medical Histories and Reflections* (1792-1798). An ardent student of English literature, he is now best known as the author of *Illustration of Sterne* (1798). Ferriar's poem, *The Bibliomania, an Epistle to Richard Heber, Esq.*, was printed in the second edition of his *Illustrations of Sterne* (1812), and had originally been published in a shorter form at Warrington in 1809 in a small quarto of 14 pages.[2] The poem begins:

> What wild desires, what restless torments seize
> The hapless man, who feels the book-disease,
> If niggard Fortune cramp his gen'rous mind,
> And Prudence quench the Spark by heaven assign'd!
> With wistful glance his aching eyes behold
> The Princeps-copy, clad in blue and gold.
> Where the tall Book-case, with partition thin,
> Displays, yet guards, the tempting charms within.

Ferriar is himself a victim:

> Like Poets, born, in vain Collectors strive
> To cross their Fate, and learn the art to thrive.

*The Wellcome Historical Medical Library.

[1] T. F. Dibdin, *The Bibliomania, or Book Madness* (1809), 58.

[2] Ferriar's poem has also been reprinted in the *Palatine Notebook* (1882), ii.

Like Cacus, bent to tame their struggling will,
The tyrant-passion drags them backward still:
Ev'n I, debarr'd of ease, and studious hours,
Confess, mid' anxious toil, its lurking powers.
How pure the joy, when first my hands unfold
The small, rare volume, black with tarnish'd gold!

But Ferriar appears to have taken the disease in a comparatively mild form and he makes reservations:

With deep concern, the curious bid me tell,
Why no Black-letter dignifies my cell:
No Caxton? Pynson? in defence I plead
One simple fact: I only buy to read.
I leave to those whom headstrong fashion rules,
Dame Julian Berners and the Ship of Fools.

Richard Heber (1773-1833), to whom Ferriar dedicated his poem, was described by Sir Walter Scott as "Heber the Magnificent, whose library and cellar are so superior to all others in the world" and by the poet Campbell as "the fiercest and strongest of all bibliomaniacs." In his case the book-collecting mania was probably of congenital origin, for Dibdin records that he saw a catalogue of his books compiled at the age of eight! His library of 146,827 volumes—probably the greatest ever accumulated by one man—was acquired at a cost of about £100,000, and was disposed of in a memorable series of sales lasting over three years. Heber was responsible for the saying that "No gentleman can be without three copies of a book: one for show, one for use, and one for borrowers." He was not a medical man, but many of the finest books of the early medical collectors found a temporary home in his great library.[3]

The subject of medical book-collectors is vast and it could be approached from various angles. Studied from one point of view it would throw light on the history of the transmission of learning. By their zeal in amassing early books and manuscripts and by their bequests and gifts the medical collectors have taken a prominent part in the building up of the great libraries of the world. The university libraries and those of the great medical corporations in particular owe much to medical bibliophiles of the past. The library of the British Museum not only owed its very foundation to the munificence of Sir Hans Sloane, but also derived

[3] W. Clarke, *Repertorium Bibliographicum* (1819), 278; *Dict. Nat. Biog.* (1891), XXV, 357.

many of its greatest treasures from the libraries of Askew and other medical collectors. The examination of early collections throws light on the history of medical education by showing which were the accepted texts for study at different periods; on a higher plane, a thoroughgoing study, on the lines of the modern bio-bibliography, would form a valuable contribution to the history of medical thought. There is also the purely bibliographical interest of these early collections; and here it must be emphasized that the libraries of the great medical bibliophiles contained many treasures in general literature and that some of the rarest and most precious works have been preserved to us in the collections handed down by physicians. The scholar-physicians of the past took all knowledge for their province and their libraries were generally richer in non-medical works than in medical; the formation of really large specialized collections on medicine is a fairly recent development. Great collectors such as Bernard, Wright, Mead, and Askew, were the means of preserving countless treasures, and there were many others who played their parts on a smaller scale. Another important function of medical bibliophiles in days when public and institutional libraries were few was that of making books available to less fortunate students. The collections of Mead and others were made available to all serious students with little formality during the lives of their owners. Apart from these considerations, stories of great libraries, of the triumphs and disappointments of book-hunting, and of particular treasures owned by the great collectors of the past will always have a fascination for those who try to follow in their footsteps. To follow any one of these lines of approach in detail would be far beyond the scope of this article, the purpose of which is rather to make a rapid survey of the whole field and to indicate some of the material that awaits investigation. These notes are concerned solely with the personal libraries of medical men, and except for a few incidental references, the libraries of universities, colleges, and other corporate bodies are not touched upon.

According to Sudhoff[4] one of the earliest relics of a personal medical library is an Assyrian clay tablet preserved in the College of Physicians of Philadelphia. This tablet contains a medical text and bears a note to the effect that it belonged to Nabû-Zêr-Kitti-Lisir, a physician who probably lived in the seventh century B. C. The remains of much older medical

[4] K. Sudhoff, "Medizinische Bibliotheken, eine historische Plauderei," *Arch. Gesch. Med.* 21 (1929), 296.

libraries have, of course, been found in Egypt; but we must pass over these collections together with those of ancient Greece and Rome, of Alexandria and Byzantium, and the monastic libraries of the Middle Ages.

When we come to the early middle ages we find many references to, and even catalogues of, private libraries, but medical collections of any size are still rarely met with.

In 1415 Ugolino da Montecantini[5] of Florence left a library of more than 100 books, of which 80 were medical. In 1450 Johannes Sindell, physician to the Emperor Frederick III, left 200 volumes of medicine and mathematics to the University of Prague.

One of the oldest and greatest of mediaeval libraries, that of Amplonius Ratingk (c.1363-1435), founder of the Collegium Amplonianum at Erfurt, has been maintained practically intact until the present day. Ratingk was Physikus or City Physician at Cologne and later, Rector of the University. He traveled in pursuit of books, bought continuously from Paris and Italy, and kept a permanent staff of copyists. From 1410 to 1412, before handing over his library, he himself drew up its catalogue, which is still extant as well as the books themselves, at Erfurt in the "Amplonianum." Ratingk's catalogue lists 640 manuscripts, comprising some 2000 different works. It is arranged in 12 classes: Grammatica (36 volumes), Poetica (37), Logica (27), Rhetorica (12), Mathematics (73), Philosophia Naturalis (64), Metaphysics (15), Philosophia Moralis (35), Medicine (101), Civil Law (7), Canon Law (16), and Theology (213). This catalogue, remarkable for its extent and its systematic arrangement, also comprises a list of desiderata. Ratingk drew up rules for the use of his library. It was open from eight to one o'clock, and loans were permitted but were carefully regulated.[6]

Our knowledge of the medical libraries of the fifteenth century has been greatly extended by the patient researches of E. P. Goldschmidt.[7]

[5] J. W. Thompson, *The Medieval Library* (Chicago 1939), 407.

[6] The catalogue of Ferrari da Grado's books has been printed by his descendant M. Ferrari, together with valuable remarks on medical literature and libraries in the fifteenth century, in his monograph *Une Chaire de médecine au XV^e siècle et un professeur à l'université de Pavia de* 1432 *à* 1472 (Paris 1899); see also Allbutt's review of this book in his *Greek Medicine in Rome* (1921), 475. Another interesting collection of manuscripts, that of Pierre Cardonnel, a celebrated physician of Paris who died in 1438, has been described by Achille Chereau, *La Bibliothèque d'un médecin au commencement du XV^e siècle* (1864).

[7] E. P. Goldschmidt, "Hieronymus Muenzer and Other Fifteenth Century Bibliophiles," *Bull. New York Acad. Med.* 14 (1938), 496; W. Schum, *Verzeichnis der Amplon. Handschriften-Sammlung* (Berlin, 1887). Ratingk's catalogue has been reprinted by P. Lehmann, *Mittelalterliche Bibliotheks-Kataloge Deutschlands und der Schweiz* (München 1928), vol. II.

While cataloguing a large collection of incunabula in the library of Prince Dietrichstein at Nickolsburg, Dr. Goldschmidt found that the same owner's inscription in red ink constantly recurred in the books. About 150 volumes bore an entry such as:

> Hic liber est mei Hieronymi Monetarii de Feltkirchen, artium et medicinae doctoris, quem mihi comparavi Nuremberge anno Domini 1482.

Hieronymus Muenzer was born in 1438 and died in 1508. He matriculated at Leipzig University in 1464, took his M.A. in 1470, and remained another four years as a junior lecturer in the arts course. He had begun the study of medicine before leaving Leipzig, as is proved by a folio volume on paper containing an extensive *Herbarius,* Bernardus de Gordonio's *De ingeniis curationum*, a brief *Bona anothomia,* and other medical texts, in the front cover of which is the note, "Iste liber medicinalis est mei Hieronymi Monetarii de Feltkirchen artium et medicine doctoris quem mihi comparavi in studio lipenzensi ann 1470." This volume is now in the Library of the Wellcome Historical Medical Museum, together with Muenzer's copies of the printed editions of Articella (1483), Bernardus de Gordonio (1480), Haly Abbas (1485), and Maimonides (1489).

In 1476 Muenzer went to Pavia, where he graduated M.D. in 1478. An interesting relic of his Pavia period is a volume of his lecture notes, containing the *Anatomy* of Mundinus, considerable excerpts from Galen and Haly Abbas, and "Consilia" of his teachers Antonio Guainerius and Ambrosio Binasco, now in the Harvey Cushing Library. From Pavia he brought back some of his finest books and he probably became a regular collector at this time. His stay in Italy coincided with the first great burst of activity of the printers, who were supplying the demand for books at moderate prices. Goldschmidt has tracked down and identified many books belonging to Muenzer's Pavia period. These include Avicenna's *Canon* (1473), Saliceto (1476), two works of his teacher Guainerius, *De febribus* and *De matricibus* (1474), Sylvaticus, *Pandecta medicinae,* and Falcutius, *Antidotarium,* bound with Albucasis, both printed by Jensen in 1474, now in the Boston Medical Library. His non-medical books include editions of Juvenal (1474), now at Yale, Lucan, Quintilian, Diogenes Laertius, Sallust, and Aeneas Sylvius. His copy of Aristotle, *De animalibus* (Venice 1476) contains the entry "In the year of the Lord 1476, in the last days of December, when we celebrate the

birth of our Saviour and indulge in all sorts of games and pastimes, I obtained this very fine book at cards and dice."

After leaving Pavia, Muenzer settled at Nuremberg and became one of the "Physici" of the city, a post corresponding to that of a modern Medical Officer of Health. He prospered and was able to travel and to indulge his passion for books. His notes show that he bought his Gordonius *Lilium medicinae* at Naples, his Claudianus and Solinus at Rome, his Boccaccio, Theophrastus, and others at Milan. The date of the purchase is usually written inside his books and has enabled Goldschmidt to trace the steady growth of his library. A catalogue of his books made in 1510 lists 185 volumes, and about 30 of these are now in the possession of various libraries in Europe and America and have been identified by Dr. Goldschmidt. His tastes were wide and after 1484 medicine does not predominate.

Muenzer had two predilections, the main one being Platonic philosophy. He obtained Ficino's Latin translation of Plato (Florence, 1487) and Plotinus on publication. His Aristotle's *Politics* contains the note:

> This most noble book on the State, written in beautiful language and full of weighty sentences, has been read through by me Hieronymus Monetarius *utriusque medicine doctor*. I read it through, I say, for the sake of recreation, in the month of May 1499, when I was suffering of a dangerous disease, and used to alleviate the intolerable pain by this very agreeable reading at Nuremberg.

His other favorite study was geography, and in this field he had the rare first edition of Ptolemy, Solinus, Mela, Aeneas Sylvius, and other cosmographical writers. Muenzer gave considerable assistance to his friend Hartmann Schedel in the preparation of the latter's great *Nuremberg Chronicle* of 1493. Muenzer's travel diary, a manuscript of 416 pages in the hand of his friend Schedel, is still preserved at Munich. It is a valuable document, of which parts only have been published.

Hartmann Schedel (1440-1514), Muenzer's friend and colleague in the office of city physician at Nuremberg, ranks as a prince of collectors and an indefatigable transcriber and preserver of books and manuscripts. Schedel's library, which is incomparably more important than that of Muenzer, has long been well known and was fully described by Stauber in 1908. Practically the whole of Schedel's library, consisting of about 350 manuscripts and of 500 to 600 printed volumes, still remains in the Munich library, of which, indeed, it forms the original nucleus.[8]

[8] E. P. Goldschmidt, *Hieronymus Muenzer und seine Bibliothek* (London 1938).

Hermann Schedel (1410-1485), Hartmann's cousin, was also a notable collector; his books passed into the possession of Hartmann at his death. It is a remarkable fact that these three friends and colleagues at Nuremberg should have been such great bibliophiles and that their libraries have been so largely preserved. Comparatively few volumes have strayed from the Schedel collection. His Petrus de Abano (Hain No. 1) and his Nicolaus Leonicenus on syphilis (1497) are both in the Cushing Library. Without an extensive library Schedel could never have compiled his great *Nuremberg Chronicle*, a popular encyclopedia containing everything popularly known about the world and its history.

Both Schedel's and Muenzer's books have survived mostly in their original bindings. They employed the same bookbinders. Schedel had nearly every book that Muenzer owned, in either the same or a similar edition, but he had far more than Muenzer, especially in the field of history. Of his 350 manuscripts nearly half are written in his own beautifully clear handwriting. He copied entire historical works, monastic annals, letters, speeches, epitaphs, inscriptions, etc., and preserved a mass of valuable material which would otherwise have been lost. His manuscript collections form an almost inexhaustible quarry for researchers.[9]

Another great fifteenth-century bibliophile, born in the same town as Muenzer, was Ulrich Ellenbog (c.1430-1499), M.D. of Pavia, who practised successively at his native town of Feldkirchen, at Augsburg, and at Memmingen. His fine library of beautifully bound books was bequeathed to the Benedictine Abbey of Ottobeuern, where one of his sons had entered as a monk and had risen to the office of Prior. The library was kept together until about twenty years ago, and it is unfortunate that its contents were not noted while still intact. Although Ellenbog's library is now scattered, Goldschmidt has seen over twenty of his books, finely printed folios in their old white pigskin bindings, generally bearing interesting marginal notes in Ellenbog's hand. A *Pharetra doctorum*, printed by Mentelin before 1474, is in the Cushing Library. The Cambridge University Library possesses a volume containing five incunabula bound up for Ellenbog at Augsburg in 1476 and full of his autograph notes ranging in date from 1476 to 1497. This fine relic of the Ellenbog collection was described (1905) by the late Robert

[9] R. Stauber, *Die Schedelsche Bibliothek* (Freiburg 1908); E. P. Goldschmidt, *op. cit.* (Note 6) 496.

Proctor.[10] A pathetic note on the back of the flyleaf of the Cambridge volume is in the form of a testament to his four sons, dated 1481, and expresses the wish that his books might be kept together after his death. Ellenbog was not only a collector of books, but also took an important part in establishing one of the first printing presses at Augsburg, that in the monastery of Saints Ulrich and Afra.

Dr. Burchard von Horneck left his splendid library of printed books and 183 manuscripts to the Bishop and Chapter of Wuerzburg in 1522. The collection is still largely preserved in the Wuerzburg University Library, although a few volumes, probably duplicates, have strayed. Two are in the British Museum and there is a Pliny in the Cushing Library. Horneck owned all of the standard Italian medical textbooks of the 15th century and many of the Latin classics.[11]

The Cleveland Medical Library has an interesting group of about 30 incunabula from the library of Dr. Nicolaus Pol, physician to the Emperor Maximilian I. One of the finest is a splendid *Ketham* of 1495. The books are all in their original bindings and bear in their covers in very bold script the lettering: "Nicolaus Pol Doctor 1494." Goldschmidt believes that the Cleveland collection represents only a fraction of Pol's library. Before they came on the market the majority of his books were in the Franciscan convent at Innichen in Southern Tyrol, but Goldschmidt found a number in several monastic libraries of Northern Tyrol.[12]

It would appear from the evidence already adduced that the possession of a very fine library was not uncommon among the higher ranks of the profession in the Renaissance. There are but few traces of private medical libraries in England prior to the sixteenth century. Thomas Linacre, founder and first president of the College of Physicians of London, gave all his medical books to the College and a room was set apart for their accommodation. The few books which he reserved for his private use are alone specified in his will. They comprised the works of Thucydides, Theodore, Appollonius, Theocritus, Pindar, the declamations of Libanius,

[10] R. Proctor, "Ulrich von Ellenbog and the Press of S. Ulrich at Augsburg," in his *Bibliographical Essays* (1905), 73.

[11] I. Schwarz, *Die medizinischen Manuscripte der koeniglichen Universitaets-Bibliothek Wuerzburg* (1907).

[12] Maggs Bros. *Catalogue of Medical Works from the Library of Dr. Nicolaus Pol* (1929). Since this paper was written Dr. Max H. Fisch has published his splendid monograph, *Nicolaus Pol Doctor 1494* (New York, Herbert Reichner, 1947), containing an exhaustive account of this great medical bibliophile. Dr. Fisch has identified no less than 467 items from Pol's library; 40 of these are in Cleveland and 13 at Yale.

and a commentary upon Homer. Linacre's library may be presumed to have comprised a good collection of the classics and medical books that had then been printed.[13] The only work in the College library which can now be identified with certainty as having been the property of Linacre is a copy of the *Scriptores de re rustica* (1496) which bears his signature and which was presented to the College in 1733 by Dr. William Woodford, Regius Professor of Physic at Oxford. In 1520 Linacre drew up a list of the books belonging to his friend William Grocyn, who died in 1519.[14] This catalogue, which enumerates 105 printed books and 17 manuscripts, was discovered among the archives of Merton College in 1889. It is entirely in Linacre's hand, and although not of direct medical interest, forms an interesting memorial of two great scholars and bibliophiles.

Although the library of the Royal College of Physicians does not itself come within the scope of this article, reference may be made at this point to some of the medical bibliophiles who followed the example of Linacre and helped to build up this noble collection.

William Gilbert in 1603 bequeathed to the College his whole library, globes, instruments, and a cabinet of minerals. In 1629 Matthew Holsbosch, M.D., a German who had practised his profession in England for fifty years, left his library of 680 volumes to the College. Further bequests and donations were made by Sir Theodore de Mayerne, by Selden, by Elias Ashmole, and by William Harvey, and the first printed catalogue made in 1660 by Dr. Christopher Merett shows that the library then comprised some 1300 volumes. After the Fire of London, which destroyed the College and its library with the exception of about 140 volumes, Henry Pierrepont (1606-1680) first Marquis of Dorchester, an Honorary Fellow of the College, presented the whole of his magnificent collection and a new library was built for its reception. The catalogue of the Dorchester collection, compiled in 1664 and written upon vellum, is still preserved; it enumerates 3200 volumes.[15]

Among later benefactors were Dr. Richard Hale (1670-1728) who left £500 for the purchase of books; Dr. Thomas Crow (1671-1751) who left a choice collection of Greek and Latin books; Dr. Thomas Gisborne

[13] J. Noble Johnson, *The Life of Thomas Linacre* (1835), 300.

[14] M. Burrows, "Linacre's Catalogue of Books Belonging to William Grocyn in 1520," *Oxford Hist. Soc. Collectanea* (2nd. Ser., 1890), 317.

[15] W. Munk, *Roll of the Royal College of Physicians* (1878), III, 364; E. Boswell, "The Library of the Royal College of Physicians in the Great Fire," *The Library*, 4th. Ser., 10 (1930), 313.

(died 1806); and Dr. Matthew Baillie (1761-1823) who bequeathed all his medical books to the College. The most important benefaction of recent times is that of Dr. David Lloyd Roberts (1835-1920) of Manchester, who bequeathed his valuable library of old medical books to the College and his collection of the works of Sir Thomas Browne to the John Rylands Library.

The library of Dr. John Clement, President of the College of Physicians in 1544, an intimate friend of Sir Thomas More, has been described by A. W. Reed.[16]

Although he was not a medical man, reference should be made to the remarkable library formed by John Dee (1527-1608), alchemist, spiritualist, and one of the most learned men of his age.

The catalogue of Dee's manuscripts, taken from an autograph list in the Gale Collection at Trinity College, Cambridge, has been reprinted by Dr. Montagu Rhodes James. Dee tried to rescue manuscripts from the dissolved monastic libraries and he also endeavored to induce the King to establish a national library. The catalogue of his library was made on September 6, 1583, just before Dee left England for the Continent. As soon as he had departed, his house at Mortlake was pillaged by the mob (owing to his reputation as a sorcerer), his books were to some extent dispersed, and his valuable scientific instruments broken. On his return six years later Dee was able to recover three-fourths of the books. The catalogue of 1583 cannot therefore be regarded as a complete record of the MSS. which Dee possessed at the time of his death. Books and manuscripts from Dee's library found their way into the collections of Digby, Ashmole, Pepys, Gale, Harley, and Sloane, and many items have been identified in the libraries of Corpus Christi College, Oxford (the largest portion found in any one place), the Bodleian, Cambridge, British Museum, Lambeth Palace, and Trinity College, Dublin.[17]

According to an account drawn up by Dee in 1592, he possessed in all about 1000 MSS. and 3000 printed books, which he valued at £2000. Dr. James, who has identified over two hundred volumes from Dee's library, thinks it doubtful whether these figures can be trusted. The catalogue of 1583 shows that Dee had over two hundred MSS. His

[16] A. W. Reed, "John Clement and His Books," *The Library*, 4th. Ser., 6 (1926), 329.

[17] M. R. James, "Lists of Manuscripts Formerly Owned by Dr. John Dee, with Preface and Identifications," *Suppl. Trans. Bibliog. Soc.* No. 1 (1921). See also Charlotte Fell Smith, *John Dee* (1527-1602), (1909).

was in the main a special collection designed to assist his peculiar studies. Had it survived intact it would have been a first-class repository of medieval science books, excluding medicine. Alchemy, astrology, physics, geometry, optics, and mathematics are all very copiously represented. Some of the treatises he mentions are not now extant. Dee left no catalogue of his printed books, but he refers to several in his diaries.[18]

A small collection of books may be as revealing as a large one, and we may now consider the books of some humbler practitioners.[19] Many, no doubt, had no more than Thomas Brydon, an apothecary of Cambridge, who died in 1589 leaving property to the value of £60. From the inventory of his goods we learn that "In the study were a table, oulde books, oulde keys and other trash, 2s. 6d. In the Hall an oulde bible and service book, 1s. 8d." Richard Meakes, a barber-surgeon of Cambridge, who died in 1604, left "old books and other lumberment" to the value of 1s.

John Thomas (?1490-1545), surgeon of Cambridge, had a very good library. He had 91 works, and of the 58 whose titles are given, 11 are medical. Of classical authors he had Ausonius, Aulus Gellius, Caesar, Cicero, Horace, Politian, Sallust, and Virgil. He had no Greek authors, but he had Greek and Hebrew grammars and several copies of the Lexicon of Calepinus. Devotional works included the New Testament in Latin, a psalter, a missal, and the Golden Legend in Latin and French. The list contains no English books, and his light reading seems to have consisted of the Italian historian Sabellicus, the Latin Comedy of Acolastus, and the Epistles of Francis Niger. The highest value for any one book is Politian's *Opera,* 16d. The total value of the books as estimated by the University appraisers is 36s. 4d., and his medical books included Galen, the Rule of Salerno, Guy de Chauliac in Latin and French (8d. and 4d. respectively), Johannes de Vigo (6d.), a herbal in French (4d.), Georgius Valla (8d.), and a "Fasciculus medicinae" 1d. (?"Ketham").

Dr. Robert Pickering, a physician of Cambridge who died in 1551, had a fine library of over 200 volumes valued at £10.14s.4d. His books are mostly in Latin and Greek, and there is only one English title. Of the 145 works mentioned by name, 43 are medical. He had Hippocrates, Celsus, Rhazes, Avicenna, Paulus Aegineta, and Aetius; and, amongst the

[18] *The Private Diary of Dr. John Dee and the Catalogue of his Library of Manuscripts.* Edited by J. O. Halliwell, Camden Soc., XIX (1842).

[19] This section is based upon the late Dr. W. M. Palmer's valuable paper on "Cambridgeshire doctors in the Olden Time," *Camb. Antiq. Soc. Proc.* 15 (1911), 200.

moderns, the anatomy of Mondino, Mesue, the medical espistles of Manardus, the dispensary of Fuchs, two works by Fernel (*De Sanguinis Ovaductione,* 4d., and *De Usu Pharmacorum,* 2d.). A copy of "Ketham's" *Fasciculus Medicinae,* valued at 1s.4d., Reisch's *Margarita Philosophia* (8d.), Galen in Greek, 5 vols., (£2). He had twelve other Galen volumes, including *De Temperamentis,* greco-lat., value 6d. His favorite "modern" author was Otto Brunfels. Plato was his most valuable classical work, 2 vols., 10s., Cicero, 2 vols., 6s., Thucydides, Pliny, Herodotus, Herodian, Diodorus Siculus, Plutarch, Socrates, Euripides, Seneca, Plautus, Pindar, Lucian, Suetonius, Martial, and Sallust. Other books listed include Boethius' *Consolation of Philosophy,* eight works of Erasmus (his contemporary at Cambridge), Luther on Deuteronomy, *Tabula* of Ptolemy, *Imago Mundi* of Peter de Alyacus (1492), the *Epitome* of Joachim Vadianus, Greek and Latin Psalters, a Latin New Testament, and the Scala Perfectionis. Reference to "A luting book" may mean that he was a musician. Light literature is represented by the *Merry Tales of Poggio* in Italian, the *Nugae* of Nicholas Bourbon, *The Beauties of the Latin Tongue* by L. Valla, and the same author's version of the *Iliad.*

John Hatcher, M.D. (?1512-1587), Regius Professor of Physic at Cambridge, had a very large and varied classical library and, what is more unusual, many contemporary works in English. These include Sir John Cheke's book on Greek Pronunciation, Ascham's *Epistles,* the Apology of the Prince of Orange, Micklethwaite's *Catechism for Householders,* Becon's *Spiritual and Precious Pearl,* and Wilkinson's *Confutation of the Family of Love, News of Strange Countries,* and many law books. His medical library, too, is on a different plane from that of any of his predecessors. It seems to have comprised all the books worth reading which had been published during or before his time. A few priced items are Galen (5 vols., £3.), Avicenna (13s. 4d.), Dioscorides (5s.), and Rosa Anglica (20d.) He also had Fallopius, Arnald da Villa Nova, Gratarolus, Cardan, Albucasis, and Benedictus Victorius; and, in English, Bright's *Treatise on English Medicine,* and Moulton's *Myrrour or Glasse of Helth,* 1540, Black-letter, value 1d.

Dr. Thomas Lorkyn (1528-1591), Hatcher's son-in-law and Regius Professor for 28 years, also had a very good library.[20] The great additions made to the literature of this country during his lifetime are shown in

[20] C. Sayle, "The Library of Thomas Lorkyn," *Ann. Med. Hist.* 3 (1921) 310.

his English books, of which he had far more than any of his predecessors. According to an inventory made at the time of his death, Lorkyn had 570 books. He had Ascham's *Schoolmaster,* Bale's *Votaries,* Elyot's *Governour,* More's *Utopia,* Skelton's *Poems,* Stubbs' *Anatomy of Abuses,* and Thevet's *New Found World,* Camden's *Britannia,* Turner's *Herbal,* 1568 (5s.), a book called *A Hundred and Fourteen Experiments of Paracelsus,* (2d.), *The Difference of the Olde Physic Taught by the Godlee Fathers and the New from Galen,* 1585 (2d.).

Lorkyn bequeathed to the Cambridge University Library "all his physic books or that appertained to physic, to be kept locked in the university library in a great cupboard."

There is an imperfect list of these books in the "Donor's Book" at the University Library. Lorkyn scribbled in nearly all his books and added his autograph monographs or his motto, "Voce et Odore." The provenance of many of his books is known. They passed from friend to friend and throw a pleasant light on the relations between some of the scholar-physicians of the Tudor period.

The copy of Thomas Muffet's *De Venis Mesaraicis Obstructis Theses,* "Praeside Felici Platero, Basle 1578," has the author's autograph inscription to Lorkyn and is apparently the only copy of this book in existence. Six books belonged to Nicholas Sympson, Barber to Henry VIII, whose picture occurs in Holbein's famous painting of the granting of the charter to the Company of Barber-Surgeons in 1540. Five books belonged to John Frere, M.D., of Padua and of King's College, afterwards President of the College of Physicians. Richard Sherman, M.D., of Caius College, gave Lorkyn the Rhazes of 1511. The collection now contains 272 books, comprising 281 works. Only four English books are left. Hippocrates is represented by 16 entries, Galen 33, Gesner, Paracelsus, Jacobus Sylvius, 8 each, Vesalius 3 (including the *Fabrica* of 1555). Lorkyn apparently had no manuscripts, but he possessed eight incunabula in eleven volumes: Nicolaus Falcutius (4 vols., Venice 1491), Savonarola (Venet. 1486), Rhazes (Venet. 1493), Avenzoar and Averroes (Venet. 1490), Sylvaticus (Venet. 1499), Saliceto (Venet. 1490), Petrus de Argellata (Venet. 1497), and Magninus (Lugd. *ca.* 1495).

John Soward, surgeon and scholar of Clare, in 1552, had Galen's *De Temperamentis,* valued at 1s., Macer's *De Virtutibus Herbarum, the Rule of Salerno,* and several works of Leonard Fuchs.

Richard Widdows, surgeon of Bridge Street, Cambridge, (died 1588) had Guido's *Questions,* Vicary's *Englishman's Treasure,* two antidotaries valued at 6d. each, a herbal, the Rule of Salerno, two books of "Secreates" valued at 12d. (probably Alexis of Piedmont), and five volumes of general literature.

Nicholas Gibbard, M.D., Fellow of Magdalen, was a younger contemporary of Lorkyn. By his will dated Sept. 4, 1593, preserved in the University archives, he gave "all the rewe of bookes begininge from Hippocrates and Goollen to the ende of the shelfe in my upper studies against St. Maries, my notebooks and writings execepted, to Magdalen Colledge, conditionallie that they be good unto my wife and childe in performinge of the coppie hould over against Magdalen Colledge." The books came to the College in 1601. Thirty-three volumes now remain, all folios or large quartos, mostly printed at Basle and Venice. A few are in the original bindings, the rest having been rebound soon after accession. The only fifteenth-century book is a Celsus (Venice, 1493).[21]

The College accounts show that 17 volumes (probably Gibbard's) were bound for 57s. 2d., and 39 were chained at a cost of 6s. 6d.

John Furtho, a Fellow of Trinity, in 1633, bequeathed twenty of his best books to the library of his College.

The personal libraries of two famous Scottish physicians are incorporated in the library of Marischal College, Aberdeen. These are the collections bequeathed by Duncan Liddel (1561-1613) and Alexander Read (1580-1644). Liddel's library is the larger and more important of the two. No list of the books bequeathed by Read survives, but a number of them have been identified by Menzies.[22] One interesting item is a copy of the first edition of Harvey's *De Motu Cordis,* containing numerous underlinings and marginal notes in red ink in Read's handwriting. Among other volumes in the library known to have belonged to Read are Monardes' *Joyfull Newes* (1577), Taliacotius (1597), and the rare English translation of Fabry of Hilden's *Lithotomia Vesicae* (1640).

Mr. L. F. Newman has copied the contemporary manuscript catalogue of the medical books in the library of Thomas Deighton, a surgeon of Gloucester who died in 1640. The collection is a remarkable one for a country surgeon and it is unfortunate that the descriptions are so brief

[21] R. T. Gunther, "The Row of Books of Nicholas Gibbard of Oxford," *Ann. Med. Hist.* 3 (1921) 324.

[22] W. Menzies, "Alexander Read, Physician and Surgeon, 1580-1641, His Life, Works, and Library," *The Library,* 4th. Ser., 12 (1932) 46.

that it is not usually possible to identify the editions in question. The 121 books in Deighton's library included works by Hippocrates, Galen, Aemilius Macer, Valerius Cordus, Realdus Columbus, Nicolas of Salerno, Fabry of Hilden, Fallopius, Arculanus, Bauhinus, Remmelin, Guy de Chauliac, Fernel, Geminus, Paré, Paracelsus, Fuchs, Brunfels, etc. The proportion of early books in English is unusually high. He had English editions of Andrew Borde, Coghan, Peter Lowe, Monardes, Conrad Gesner, John Jones, Thomas Gale, Timothy Bright, Ulrich Hutten, and John Bannister.[23]

Prof. Tricot-Royer[24] has published an exhaustive analysis of the catalogue of the library of Vopiscus Fortunatus Plempius (1601-1671), Professor of Medicine and Rector of the University of Louvain. This library represents the working collection of an eminent medical teacher and consultant of the seventeenth century and provides valuable material for the history of medical libraries. Tricot-Royer found this catalogue in a volume containing 30 sale catalogues of seventeenth-century libraries in the Library of the Faculté de Médecine at Paris. The original printed catalogue is a quarto of 34 pages. The cover and title-page are missing, but the top of page 3 (the first in the book) bears the manuscript note: "Catalogus Librorum CL. Dni Plempij vendendorum Lovanij 1672," and a second note in another hand: "Bibliotheca Plempij venalis Lovanij 1672 per Nempaeum." It may be noted that Nempaeus was a publisher and bookseller of Louvain who issued the fourth edition of Plempius's *Fundamenta seu Institutiones Medicinae Libri VI* in 1664.

The number of titles listed in the catalogue is 1074, made up of Medical Books (768), Politics, History, Literature (238), Spanish and Italian (8), Greek and Latin (23), Oriental (39), together with various Arabic, Chaldee, and Talmudic items that are not enumerated by title. The 768 medical books were bound in 792 volumes, of which 173 are described as folios, 233 as quartos, 163 as octavos, and 93 as duodecimos. The titles, as in nearly all early catalogues, are much abbreviated and in many cases are so cryptic that the learned editor has not always been able to identify the edition.

[23] E. A. B. Barnard and L. F. Newman, "John Deighton of Gloucester, Surgeon," *Trans. Brist. and Gloucest. Archaeol. Soc.* 64 (1943) 71. The authors of this extremely interesting paper intend to publish the complete catalogue of Deighton's books in *The Library*.

[24] Tricot-Royer, *La Bibliothèque de Vopiscus Fortunatus Plempius, professeur de Médecine au XVII^e Siècle*, (Mém. couronnés par l'Acad. Roy. de Méd. de Belgique, Tome xxii, fasc. 5, Brux., 1925).

A classification of authors according to their country of origin shows that Plempius possessed the writings of 145 Italians, 91 Germans, 83 French, 33 Dutch, 28 Belgians, 24 Spaniards, 19 Ancient Greek, 18 English, 10 Portuguese, 9 Swiss, 7 Arabs, 6 Romans, 3 Danes, and 1 Swede.

As Regius Professor, Plempius had to expound the writings of the "Fathers" of medicine and we can obtain some idea of the relative importance attached to their writings at that time by their representation in the catalogue. Thus we find that he possessed the works of Hippocrates and the writings of 57 commentators upon him, Galen (36 commentators), Avicenna (16), Aristotle (6), Dioscorides (6), Rhazes (4), Pliny (3), and Theophrastus (2).

The majority of the books in this catalogue are collected works, "Practices" of medicine and surgery, treatises on anatomy, physiology, gynecology, embryology, and so forth, but besides these comprehensive works there are a number of books dealing with more circumscribed subjects. Tricot-Royer classifies them as follows:—

Pharmacology and Materia Medica (40 writers), Plague and Pestilence (20), Medical Chemistry (14), Zoology (13), Botany (10), Magic and Astrology (9), Balneology, Hydrotherapy, etc. (7), Venoms (6), Moral Hygiene and Prophylaxis (4), Deontology (4), Physics (3), Teratology (3), History of Medicine (2), Salerno (2), Medical Education (1), Legal Medicine (1), and Veterinary Medicine (1), and Embalming and Burial (1).

Tricot-Royer justly laments the fact that a collection of 1016 books bequeathed to the Medical College of Antwerp in 1620 by Dr. Jean Ferreulx was sold to rehabilitate the finances of the College in 1818 for 200 florins.

A very interesting and valuable library is that of Sir Kenelm Digby (1603-1665), not a regular practitioner but a notable dabbler in physic, part of whose library was sold on April 19, 1680, at the Golden Lyon, over against the Queen's Head Tavern in Paternoster Row.[25] The auction catalogue of 135 pages enumerates 5400 lots, of which 315 are medical. Books from the Digby collection recur in modern sales, mostly bound in morocco and having the Digby arms and monogram "K.V.D.," the "V" standing for the initial of his wife's name Venetia. Digby was one

[25] J. F. Fulton, *Sir Kenelm Digby, Writer, Bibliophile and Protagonist of William Harvey* (New York 1936); J. Lawler, *Book Auctions in England in the Seventeenth Century* (1898) 36.

of the earliest collectors to clothe his books in fine bindings, most of them being the work of the best French binders of the period. Part of Digby's library had been conveyed to France during the Civil Wars. He died there in 1665 and these books were forfeited to the French Crown by "Droit d'Aubain." The library was sold in Paris for 10,000 Crowns but Digby's relative, the Earl of Bristol, repurchased part of it. Many of his books, sumptuously bound in red morocco, are still to be seen in the Bibliothèque Nationale.

The Digby sale of 1680 realized over £900. The library contained a great number of incunabula, including a few Caxtons, many 16th century books, classics, history, travel, and belles-lettres. Under the heading of "Pamphlets" we find lots including Shakespeare's "Rape of Lucretia" and Hesiod's "Georgics" by Chapman, "in all 22 pieces, 3s.," and "Twelve plays written by Shakespeare, Shirley, Heywood, Chapman, etc., 3s." Rare Americana appear as "Tracts" throughout the catalogue and average about 4d. each. At the end of the catalogue there are 69 lots of MSS., chiefly historical and astrological made for the Earl of Bristol. It appears that these MSS. were sold separately on May 13, 1680.

In his lifetime, Digby became possessed of the valuable library of books and MSS. of his tutor, the learned Thomas Allen, of Trinity College, Oxford. He presented this collection to the Bodleian. In 1655 he presented 17 books to Harvard College. John Evelyn[26] considered the Digby library to be "of more pomp than intrinsic value, as chiefly consisting of modern poets, romances, chemical and astrological books,"and we may conclude that the diarist did not share the opinion expressed in Richard Farrar's epitaph on Digby which described him as:

> This age's wonder for his noble parts,
> Skilled in six tongues and learned in all the arts.

Nathan Paget (1615-1679), M.D. Leyden, Physician to the Tower of London, Harveian Orator and five times Censor of the College of Physicians, was the intimate friend and counsellor of John Milton. He was one of eight London physicians who collaborated with Glisson in collecting the material for the treatise on rickets, eventually published by Glisson alone. A copy of the auction sale catalogue of his library, dated Oct. 24, 1681, is in the British Museum.[27] Paget's was the first medical

[26] J. Evelyn, *Diary and Correspondence*. Edited by W. Bray (1902) III, 309.

[27] J. H. Hanford, "Dr. Paget's Library," *Bull. Med. Lib. Assoc.* 33 (1945) 91.

man's library to be auctioned in England.[28] The books were auctioned by William Cooper, who had introduced this method into England in 1676. Cooper came to share the business with Edward Millington, a famous bookseller, with whom Milton, himself an inveterate book buyer, lived for a while in Little Britain. Cooper and Millington had neighboring shops and Milton and Paget must often have been in and out of them together.

The catalogue consists of 52 pages, and lists some 7000 to 8000 volumes. The books were on exhibition in Cooper's shop a week before the sale. The auction, according to the preface, was to begin at eight in the morning and last about four days. Paget's library was a very fine one, for that or any other time, and the catalogue bears witness to his scholarship and to the wide range of his interest. There are listed in all 2178 lots, including 34 bundles of pamphlets. Following the usual practice, the catalogue classifies the books according to size, subject matter, and language.

Latin medical and chemical books account for 816 lots, theological and philological books for 615, English books (mostly non-medical) for 723, and pamphlets (mixed languages and subjects) for 34.

There are a large number of books on the occult sciences. Here we find the early writers on astrology, the philosophers, the elixir of life, ghosts, apparitions, witchcraft, possession by demons, exorcism, the writings of Cardan, Paracelsus, H. Cornelius Agrippa, Roger Bacon, Robert Fludd, van Helmont, Jacob Boehme, William Lilly, Raymond Lully, J. B. Porta, Basil Valentine, J. R. Glauber, and many other less known and anonymous writers. It seems that less than one-half of the Paget collection was strictly medical, but he had all the necessary tools of his profession and a great deal more. His collection of the editions of Hippocrates, Galen, and Averroes, was very fine, and the only notable names that do not appear in the catalogue are those of Dioscorides, Celsus, and Vesalius.

Besides the medical classics there is a great variety of works on chemistry, mathematics, and related subjects. There are a number of works on wine and liquor making, on fasting women, and on plague. Although many of his medical books were printed before 1600 he had enough of later date to indicate that he kept well abreast of his age. He had the first edition of Harvey's *De Motu* and much related material, and the writings

[28] J. Lawler, *op. cit.* (Note 25), 59.

of Glisson, Charleton, and Sydenham. The works of mathematicians, such as Oughtred, Descartes, and Paget's younger contemporaries Wallis, Newton, and Isaac Barrow are included. There is much mystical, heretical, and sectarian literature. He had a remarkable collection of works on Socinianism, and nearly all the writings of the German mystic and reformer Jacob Boehme. There are many Quaker items, including the writings of George Fox, and several of the Americana. As befitted a friend of Milton, he had several tracts on freedom of conscience and of the press.

Paget evidently had a great love of literature for its own sake, and he possessed a not inconsiderable collection of his friend's works, including *Areopagitica,* two copies of the first editions of *Paradise Lost* and *Paradise Regained,* and many others.

The library of the Rev. Dr. Whately, of Banbury, Oxon, which was auctioned by Edward Millington on April 23, 1683, is of special interest because it was sold together with the Physick Library of Simon Rutland, late of Brentwood in Essex. Rutland's library was the first special collection of medical books (apart from the general libraries of doctors) to be sold at auction in this country. According to the sale catalogue, the Physick Library was "replenished with variety of the best and most modern books in that Faculty, which will recommend them (to all the generous Professors of it) as being the first experiment in this nature so much desired and expected." Millington altered his hour of selling for this auction, beginning in the morning at the unusually late hour of ten, and selling only till twelve, resuming in the afternoon at three and continuing until seven. The medical books, which represent a comparatively small section of the 3115 lots in the catalogue, are chiefly foreign, modern editions of the old medical writers, and the treatises of learned contemporary physicians, mixed with the more empirical writings of the alchemists and herbalists.

John Knight (1600-1680), Sergeant Surgeon to Charles II, Surgeon General to the Forces and Master of the Barber Surgeons Company, had a valuable collection of heraldic manuscripts and a library of printed books on heraldry, genealogy, antiquities, and topography. He was a friend of Samuel Pepys, to whom he left three volumes of the works of Hubert Goltz, the numismatist, in order, no doubt, to complete the diarist's set. Of the set of five volumes now in the Pepysian Library at Magdalene College, Cambridge, three are beautifully bound in vellum, the remaining two being covered in ordinary binding. To Gonville and

Caius, his own College, he left some 60 volumes of heraldic manuscripts. His copy of Dugdale's *Baronetage,* 2 vols., 1675-1676, is embellished with about seven hundred drawings of coats of arms. The flyleaf of the first volume bears the following inscription in Knight's hand:—

> This volume no erratas has;
> The whole may for erratas pass.
> If to correct them you intend
> You'l find it Labour without end.
> Tis therefore better let them go.
> God only 'tis, knows who getts who.

To the town of Ipswich he left a valuable collection of printed books on genealogy, heraldry, antiquities and topography, including works by Dygdale, Ashmole, Plot, and Thoroton. The collection is still preserved in the Central Library of the Borough of Ipswich. To his quondam servant, John Franklin, and to Christopher Todd, his apprentice, he left "all my books of physick and chirurgery and all my instruments, etc., to be equally divided between them." Nothing further is known about his medical books.[29]

Dr. Claver Morris (1659-1726), M.D. Oxford and Extra-Licentiate of the College of Physicians, enjoyed a large practice at Wells in Somerset. A vehement Tory and high churchman, he was a man of very varied interests and accomplishments, holder of public offices and an enthusiastic musician. He kept very careful accounts during 1686-1723, which have survived, and a diary of which a few years only are extant. The list of books published by Hobhouse[30] probably represents all he purchased during 1686-1723, but he must have possessed a number of medical and scientific books as well as classics before he came to Wells.

His library is that of a man of culture interested in most phases of the social and political life of his time. He purchased classics, history, polemical theology of the High Church order, a large number of mathematical books (ranging from Cocker's famous work to Newton's *Trigonometry*), and music. The literature of the day is represented by Dryden, Swift, *The Spectator,* and some ephemeral pieces. He had several books on the Turkish nation and religion, which illustrate the preoccupation

[29] E. M. Calvert and R. T. C. Calvert, *Serjeant-Surgeon John Knight, Surgeon General, 1664-1680* (1929); M. R. James, *Descriptive Catalogue of the Library of Gonville and Caius College,* Cambridge (1908).

[30] E. Hobhouse, *The Diary of a West Country Physician, A. D. 1684-1726* (1934); "The Library of a Physician circa 1700," *The Library* N. S. 13 (1932) 89.

with the ever present menace of Turkish advance felt at that time. The frequent occurrence of "S" in the Diary shows that he had studied his books, but he makes no comments on what he had read. Morris was well read in the science of his time, especially in chemistry, was versed in the classics, and was something of a mathematician with a taste for mechanical contrivances of all sorts.

In October 1686 he bought Etmullerus' *Opera Pharmaceutica Chymica* (8s.); Dolaeus' *Encyclopaedia* (7s.); Jones' *De Febribus Intermittentibus* (2s. 6d.); and Riverius' *Arcana* (1s.); in August 1689 Sir Walter Raleigh's *Marrow of Hist.* (2s.); Smetius' *Prosodia* (2s.); Wilkins' *Mathematical Magick* (2s. 6d.); and *Arte Treasury* (1s.).

In the same year he gave 10s. for an old copy of Pliny's *Natural History,* and in 1701 he paid 4s. 6d. for a Tauveray's *Anatomy* and for a *History of Physic.* For the titling of 15 volumes, he paid 3d. a volume. Binding was cheap. For Scapula's *Lexicon* and Belengardus's *Sentences* he paid 5s., and for binding three other folios, "but one of 'em large," 16s.

In 1703 his only purchase was Pitt's *Crafts and Frauds of the Apothecaries* (2s.).

In 1705, he brought his medical library up-to-date by numerous purchases, including works by Baglivi, Harvey, Sydenham, Lemery, Mead, Coward, Verduc, and Burmannus. A treatise on urines by T. H. cost 1s.2d. In the same year he bought Clarendon's *History* (3 vols. £2.6s.0d.), Collier's supplement to his dictionary, St. Augustine's *Meditations* by Dr. Stanhope, Cocker's *Decimal Arithmetic* (3s.9d.), and others.

In 1709 he bought at Bath Sir John Floyer's *History of Cold Baths.* At Wells in the same year he bought Portal's *Midwifery, The London Cases,* Digby *Of Bodies,* Cole's *Short Hand,* and Newton's *Trigonometry,* second hand (5s.). In 1711, his purchases included *The Hospital Surgeon* (2/6), Balinus *De Urinis, Pulsibus* etc. 4to. (9s.), Dale's *Pharmacopologia* (2 vols., 6/9). He subscribed for the *Poetarum Latinorum Opera,* paying a first instalment of £1.0s.6d.

In 1713, he bought Prideaux's *Life of Mahomet,* the *Koran* in English, and Dryden's *Virgil,* on Royal paper with cuts, in folio (£1). Later purchases include Forestus' *Observationes Medicinales* (2 vols. folio £1); Schroderus' *Pharmacopoeia Medica Chymica* (9s.); Struthers' *Corticon Febrium;* Quincy's *Pharmacopoeia Officinalis et Extemporanea* (7s.); Lemnius' *Observationes Medicinales* (3s.); Knolles' *History of the Turks*

(4s.3d.); and Cheyne's *Observations about the Gout and the Bath Waters* (2s.6d.).

He also bought either for himself or for the Musical Club, of which he was the leading spirit, large quantities of music yearly.

The libraries of Drs. Christopher Terne and Thomas Allen were sold by Edward Millington at the Auction House in Ave Mary Lane on April 12, 1686. An appendix to the sale catalogue lists books on medicine belonging to Dr. Robert Talbor, the author of *Pyretologia.*[31]

Millington's preface reveals that the sale by auction of special professional books of the character contained in this catalogue had not hitherto met with unqualified success.

> This catalogue presents you with the Medicinal Parts of the Libraries of those two Worthy Persons mentioned in the title page, amongst which, it's obvious to every one that is competently skilled in the editions and hath tolerantly informed himself of what's printed in the Faculty, to remarque several valuable and scarce Books. The late Sales of Books of this nature have been so much discouraged, either through the forgetfulness of the Gentlemen of the profession as to the Time, or by reason that the hours of Sale have interfered with their business, that I had once resolved to have disposed of them another way; but upon second thoughts this Experiment is made intentionally accommodated of the supposed leisurable time of the practisers of that Noble Science, viz., from the hours of 10 to 12 in the morning, and from 3 to 6 in the evening; and when I also reflect that they were the Books of two eminent Physicians who were generally known to be buyers of the Choicest Books, I presume to promise myself an incouragement in some measure answerable to the trouble and expense of the Undertaking.

This catalogue contains 24 pages, lists 1051 lots, and consists entirely of English and foreign works on medicine then used by the Faculty.

The libraries of several eminent foreign medical men were sold in England. In 1655 the library of Jean Riolan the Younger (1580-1657) was offered for sale by John Martin and James Allestrye at the Sign of the Bell in St. Paul's Churchyard. A copy of the sale catalogue is in the Bodleian. No prices are given, the vendors apparently having a look at the customer and pricing accordingly.[32] Parts of Hermann Boerhaave's library were sold in London on December 10, 1739 and April 16, 1740.

Sir Charles Scarburgh (1616-1694), physician to Charles II, James II, William III, and Queen Mary, was a noted bibliophile and owned a very valuable library of mathematical works and Greek classics.[33] A copy of

[31] J. Lawler, *op. cit.* (Note 25), 86.

[32] British Museum, *List of Catalogues of English Book Sales, 1676-1900*, 1915, p. xii. See also *Bibliotheca Osleriana*, note to No. 3806, p. 346.

[33] R. Crawfurd, *The Last Days of Charles II* (Oxford 1909) 55.

the sale catalogue of his library dated 1695 is in the British Museum. Evelyn[34] records (March 10, 1695) that he dined at the Earl of Sunderland's with Lord Spenser. "My Lord showed me his library, now again improved by many books bought at the sale of Sir Charles Scarburgh, an eminent physician, which was the very best collection, especially of mathematical books, that was I believe in Europe, once designed for the King's Library at St. James's; but the Queen's dying, who was the great patroness of that design, it was let fall, and the books were miserably dissipated."

One of the most extensive and interesting of the private libraries sold by auction in the seventeenth century was that of Dr. Francis Bernard, physician to St. Bartholomew's Hospital.[35] The auction was held at the doctor's own house in Little Britain and began on October 4, 1698. The sale catalogue is a volume of 450 pages, and there are on the average 30 lots—some 50,000 volumes. The library is described as a "large collection of the best Theological, Historical, Philological, Medicinal and Mathematical Authors in the Greek, Latin, Italian, Spanish, French, German, Dutch and English tongues." The catalogue has a most interesting Preface:

> The character of the person whose collection this was is so well known that there is no occasion to say much of him . . . This I think may with truth and modesty enough be said, that as few men knew books, and that part of learning which is called 'Historia Literaria' better than himself, for there never yet appeared in England so choice and valuable a Catalogue to be thus disposed of as this before us, more especially of that sort of books, which are out of the common course, which a man may make the business of his life to collect, and at last not be able to accomplish. A considerable part of them being so little known that even to many of the learned buyers, that we have reason to apprehend this misfortune to attend the Sale, that there will not be competitors enough to raise up to their just and real value. Certain it is this Library contains not a few which never appeared in any auction here before; nor indeed, as I have heard him say, for aught he knew, and he knew as well as any man living, in any printed catalogue in the world.
>
> We must confess that being a person who collected his books for use, and not for ostentation or ornament, he seemed no more solicitious about their dress than his own; and therefore you'll find that a gilt back or a large margin was very seldom any inducement to him to buy. It was sufficient that he had the book. . . . But that he himself was not a mere nomenclator, and versed only in title pages, but had made that just and laudable use of his books, which would become all those that set up for collectors, I appeal to the letterati of his acquaintance who conversed most frequently with him, how full, how ready and how exact he was in answering

[34] Evelyn, *Diary* (1902) II, 346.

[35] N. Moore, *History of St. Bartholomew's Hospital* (1918) II, 630; T. F. Dibdin, *Bibliomania* (1842) 316; W. Clarke, *Repertorium Bibliographicum* (1819) 397.

any question that was proposed to him relating to learned men or their writings, making no secret of anything that he knew, or anything that he had; being naturally one of the most communicative men living both of his knowledge and of his books.

As for the books of his own faculty, tho' it be not an entire collection (for who could, or rather, who would, have one in Physick?) yet it may be said, that it is infinitely the best and largest that ever yet appeared in these islands; and from hence the gentlemen of his own profession (I mean the learned part of them who are still of opinion that books and reading may be of some use to them in the Art of Healing) may be supplied with almost everything necessary or useful in it.

Bernard was an omnivorous collector, but he bought his books for use, and is said to have read all of them. Besides the classical languages he knew Italian, French, and Spanish, and his prodigious memory was a source of wonder to his friends. He took a keen interest in astrology and this foible and the untidy state of his library are tilted at by Garth in *The Dispensary,* in which Bernard figures as "Horoscope":

> An inner Room receives the numerous shoals
> Of such as pay to be reputed Fools,
> Globes stand by Globes, Volumes on Volumes lie,
> And Planetary schemes amuse the eye.

The Bernard catalogue is classified as follows, the figures being the number of pages represented by each section:

English books	74
Foreign Theology	31
Foreign Law	9
Mathematics	26
Medicine	125
Philology	151
Italian, Spanish, French	34

Considering the great size of the library the number of fifteenth-century books—about one hundred—is small.

From a copy priced in a contemporary hand (in the possession of John Lawler) we give some of the prices of medical and scientific incunabula:

	s.	d.
Isidori Hisp. Liber Etymologiarium. Venet. 1488 Albohazen Haly de Judiciis Astrorum. Ibid. 1485	1	6
Jo. Regiomontanii Ephemerides Augustae. 1488	1	0
Avicenna de Partibus. 4 vols. Lugd. 1499	8	6
Arculani Practica. Venet. 1497	1	0
Petrus de la Certata, Chirurgia. Venet. 1492	1	6

Alberti Magni de Animalibus, Venet. 1497 Aristotelis de Natura Animalium, Ib. 1498		1s.	8d.
Celsus, Venice 1497 Aulus Gellius. Ib. 1496	£1	9s.	6d.
Dioscorides, Venet. Aldue 1494			
Nicander. Theriaca. Ib. 1499			
Procli Sphaera. Ib.	£1	7s.	6d.
Magnini Regimen Sanitatis. Lovan. 1482		1	0
B. de Gordonis, Lilium Medicinae, Venet. 1496 Aegidius de Cognoscendis Urinis, Ib. 1494		1	1
Mundini Anatomia, Papii. 1478		2	2
Vales de Tharanta, Practica. Lugd. 1490			7
Bartholomaeus Anglicus De Proprietate Rerum. August, 1491		4	0
Plinio Historia Naturale, Venet. 1481		5	2

Editions of the Greek and Latin classics fared somewhat better.

Homer. 2 vols. Florence, 1488 fetched	£1	12	0
Terentius. Tarvisii 1477	1	11	0
Cicero ad Atticum, Rome 1470	3	3	0

There were in addition no less than 22 Caxtons, by far the largest number in any sale to that date. These sold for a total sum of £4.13s.0d., an average sum of just under 4s.3d. each!

In examining the entries for English books printed before 1600 one is struck by the extremely small sums realized. The rarest black-letter items fetched only a few pence. Many books and pamphlets relating to America went for a few shillings and in some cases pence. The total sum realized by the Bernard sale was £5000, and the highest sum paid for any one book was £10 for Walton's Polyglot Bible. The lowest, the sum which most frequently occurs in the catalogue, is 4d. As no sum occurs below 4d., we may conclude that this was the lowest at which bidding might be started, increasing by penny biddings up to a pound, and sixpenny ones after that sum had been reached.

Bernard possessed a copy of Harvey's *Exercitationes de Generatione Animalium* given to him by the author, who was his colleague at St. Bartholomew's, in the year of its publication (1651). He was fond of poetry, for he had several copies of Chaucer, a Gower of 1554, a Spenser of 1611, besides Drayton, Ben Jonson, Shirley, Waller and Fletcher. It is rather remarkable that his only Shakespeare was a *Rape of Lucrece*.

Charles Bernard (1650-1711), Francis's younger brother, surgeon to St. Bartholomew's Hospital and Sergeant-surgeon to Queen Anne, was the first surgeon in England to own a really extensive library. The sale of

his books began on March 22, 1711. One of his treasures is mentioned by Budgell in *The Spectator*[36] of May 27, 1712: "Nothing has more surprised the learned in England that the price which a small book, entitled *Spaccio della Bestia Triumfante* (*sic*), bore in the late auction. This book was sold for thirty pounds." The book is the first edition of Giordano Bruno's famous allegory (Venice, 1584). According to the late Sir Norman Moore,[37] Charles Bernard bought the Bruno at the sale of his brother's library in 1698 for 15 guineas, and it fetched £28 in 1711, not £30. As an example of the vagaries of book prices it may be mentioned that another copy of the work was bought in 1706 at the Bigot sale *with five other books* for 2s.1d.

Swift, in his *Journal to Stella* (March 19, 1711) records: "I went to see poor Charles Bernard's books, which are to be sold by auction, and I itch to lay out nine or ten pounds for some fine editions of fine authors. But 'tis too far, and I shall let it slip, as I usually do all such opportunities." On the 29th he reports that he did go to the auction, but "they were in the middle of the physic books; so I bought none; and they are so dear. I believe I shall buy none, and there's an end." On April 11th, he writes: "I went to the auction of Charles Bernard's books, but the good ones were so monstrous dear, I could not reach them, so I laid out one pound seven shillings but very indifferently, and came away, and will go there no more." However, on the 13th we read: "At evening I went to the auction of Bernard's books, and laid out three pounds three shillings, but I'll go there no more; and so I said once before, but now I'll keep to it."[38]

According to his earliest biographer, Dr. Edward Tyson, F.R.S. (1650-1708), the great comparative anatomist, entertained about 1696 the idea of building a library for the College of Physicians to which he also intended bequeathing his own books "of which he had a Noble Collection and almost everything that related to Physick." For some reason Tyson never proceeded with this design, and he eventually left his library to his nephew Richard Tyson. Some of his MSS. did find their way to the library of the Royal College of Physicians, together with a few of his printed books.

In 1706, Tyson presented some books and MSS., including several of his own works, to the Bodleian Library. The letter which accompanied the gift, addressed to Dr. John Hudson, Bodley's Librarian, is extant. By

[36] *The Spectator.* Edited by G. A. Aitken (1898) V, 353.

[37] N. Moore, *op. cit.* II, 630.

[38] Swift, *Prose Works.* Edited by F. Ryland (1922) II, 140.

his will he bequeathed the works of Aldrovandus in 13 volumes folio to the Royal Society.[39]

Sir Thomas Browne in his *Religio Medici* deplored the multiplicity of books and wished "for the benefit of learning, to reduce it, as it lay at first in a few and solid authors; and to condemn to the fire those swarms and millions of rhapsodies, begotten only to distract and abuse the weaker judgements of scholars, and to maintain the trade and mystery of typographers." Sir Thomas had a most remarkable and extensive library for a man expressing such sentiments and the statement is, no doubt, as Keynes says, purely rhetorical. The sage of Norwich was a persistent and omnivorous collector and reader of books. His library was sold by Thomas Ballard at the Black Boy Coffee House in Ave Mary Lane, near Ludgate, in January 1711. Only two copies of the sale catalogue are known to exist, one in the British Museum and the other in the Osler Library.

The catalogue contains something under 2500 volumes. Of these some 420 are dated after 1682, the year of Browne's death, and must have belonged to his son Edward. Edward's interests were much narrower than those of his father, and there was probably much tampering with the library between 1682 and 1711. Only one or two of the books can be identified at the present day as having belonged to Browne. His copy of Evelyn's *Sculptura* (1662) is in the Pierpont Morgan Library. Mr. Geoffrey Keynes has a copy of Leland's *Cygnea Cantio* (1658), which almost certainly belonged to Browne.

Several analyses of the catalogue have been made and these provide valuable evidence of Browne's literary sources.[40] The extraordinary diversity of his interests and the vast range of his reading are illustrated at every point. There are books on such diverse subjects as medicine, theology, astrology, alchemy, magic, catalogues of auction sales, Egyptian plants and medicines, dictionaries, acts of Parliament, seamanship, travel, coins, and medals. The catalogue contains 2377 lots, classified as Libri Theologici; Historici; Philologici; Medici; Philosophici; Mathematici; Livres François; Libri Italiani; Libros Espannolos; Libri Teutonici and Belgice; English Books; Libri Omissi; English Folios Omitted.

The books under each head are further divided by size. In medicine he had Hippocrates, Galen, Avicenna, Serapion, Averroes, Paracelsus,

[39] M. F. Ashley Montagu, *Edward Tyson, M.D., F.R.S., 1650-1708* (Philadelphia 1943) 215, 358.

[40] G. Keynes, *A Bibliography of Sir Thomas Browne, Kt., M.D.* (Cambridge 1924) 182; M. Letts, "Sir Thomas Browne and His Books," *Notes and Queries*, 11th Ser. 10 (1914) 321, 342, 361; R. Sencourt, *Outflying Philosophy* (1925).

and Dioscorides. Edward Browne borrowed his Lacunius' Epitome of Galen (Lugd. 1554). One of his favorite books was Bartholin's *Centuries of Rare Observations.* "Mine are in three volumes in 12 mo or small octavo" he writes. "I cannot be without them.'

The *De Vulgi Erroribus* of Laurentius Joubert (Ant. 1600) is in the catalogue and no doubt influenced Browne in his choice of a title for *Vulgar Errors.* The library was rich in books on natural history. He subscribed to Grew's *Anatomy of Plants* (1682) as it came out and also obtained several subscriptions from friends. Garcia ab Horto's *Simples and Drugs of India* which he had in the abridged translation in the *Exotica* of Clusius (1605) he quotes again and again. He had the works of Aldrovandus, Rondeletius *De Piscibus Marinis* (1554), Belon's *De la Nature des Oyseaux* (Paris 1555), Ray's edition of Willoughby (1676). Athanasius Kircher is well represented, and another favorite book was Alexander ab Alexandro's *Gemales Dies,* a mine of information on Roman philology and antiquities.

He had Gruter's *Corpus* of ancient inscriptions and Paulus Jovius' *Elogia Doctor. Viror.* (Bas. 1571).

Here is the very copy of Caelius Apicius *De Re Culinaria* (Bas. 1541) from which he obtained the hint for his celebrated pickles containing oysters, anchovies, cucumbers, onions, and Rhenish wine. He was well stocked in the classics, having Homer, Aristotle, Strato, Pausanias, Thucydides, Herodotus, Plutarch, Athenaeus, Virgil, Solinus, and Pliny among others. Aristotle's *Historia Animalium* with Scaliger's commentary must have been in constant use. "Mine was printed at Thoulouse 1619, in fayre letter Greek and Latin . . . somewhat a thick folio," he writes to Edward in 1679. He had North's Plutarch, Holland's Pliny and Suetonius and Plutarch's *Morale,* Ogilby's *Iliad,* Stapylton's *Juvenal,* and Entropius' *History* translated by several hands, 1614.

In English literature he had *Hudibras* (although Part III only is in the catalogue), Michael Drayton, Spenser, Milton, Ben Jonson, Beaumont and Fletcher, Cowley, Walton and Cotton, Herbert's *Temple,* and Samuel Daniel's *Poetical Essays.* Shakespeare does not figure in the catalogue, and we can only assume that some items have gone astray. There is only one book on witchcraft (*The Opinion of Witchcraft Vindicated in an Answer to a Work Entituled the Question of Witchcraft Debated* . . . by R. T., 1670)—a tract which cost 10d. The foreign section of the catalogue contains some 480 titles, and is extremely interesting.

John Dee (1527-1608)
Engraved by W. P. Sherlock from a picture in the Ashmolean Museum, Oxford.

Francis Bernard (1607-1697)
From an anonymous engraving.

Sir Robert Sibbald (1607-1697)
Engraved by Lizars from the portrait in the Royal College of Physicians of Edinburgh.

Charles Bernard (1650-1711)
From a portrait in the Wellcome Historical Medical Museum, London.

Sir Charles Scarburgh (d. (1694)
Engraved by J. Brown from the picture
in the Barber-Surgeons' Hall, London.

Anthony Askew (1722-1774)
After the picture in
Emmanuel College, Cambridge.

Richard Mead (1673-1754)
Engraved by B. Baron after
Alan Ramsay.

John Ferriar (1761-1815)
Engraved by G. Bartolozzi, from a drawing
by G. Stothard, R.A.

Professor Robert R. Cawley[41] has subjected Browne's literary sources to an exhaustive analysis and has studied his methods of working and composition. He has shown that Browne was acquainted with nine or ten languages. Browne was well described by Coleridge as "a hunter of oddities and strangenesses." His interest in foreign travel accounts for a generous portion of his reading. It is evident that his work was based on a system of commonplace books. He developed an uncanny faculty for picking out the particular oddities which were his favorites. From a vast tome he could extract some relatively insignificant detail such as a reference to the width of the Nile. Browne was forever complaining about the costliness of books and forever buying them. He had a passion for maps, and owned Moses Pit's *New English Atlas,* one of the most expensive books of the time (2 Gns.)

His extraordinary memory and knowledge of books are shown by his correspondence. In 1618 he writes to Edward, then on his travels:

> Dr. Merrett's comment upon Neri de Arte Vitriaria is new come out in Latin. His Pinax Rerum Britanicarum not yet published; I send to him agayne next weeke. Mr. Mayoe, of All Souls, his book De Respiratione et Rachitide, newly come out; also Mr. Boyle's continuation of new experiments concerning the spring and weight of the Ayre, English, 4to. I keepe the sheets of the Transactions as they come out, monethly.

His letters both to Thomas, his younger son in the Navy, and to Edward, the physician, are full of advice on books and show that he kept a close watch on all new publications. A letter to Edward (June 28, 1679?) provides proof of his remarkable memory:

> This day one came to show mee a booke and to sell it; it was a *hortus hyemalis,* in a booke, made at Padua, butt I had seen it above thirtie years ago, and it containes not many plants.

In his letter of advice to Dr. Henry Power of New-Hall, near Ealand Yorkshire (1647), Browne[42] gave a list of books which he considered necessary for a physician's library. After exhorting his young friend to "lay his foundation in anatomy," he goes on:

> The help that books can afford you may expect, besides what is delivered sparsim from Galen and Hippocrates, Vesalius, Spigelius, and Bartholinus. And be sure

[41] R. R. Cawley, "Sir Thomas Browne and His Reading," *Publ. Mod. Lang. Assoc. Amer.* 48 (1933) 426.

[42] Browne, *Works.* Edited by S. Wilkin (1884) III, 483.

you make yourself master of Dr. Harvey's piece De Circul. Sang., which discovery I prefer to that of Columbus . . . Read Theophrastus, Dioscorides, Matthiolus, Dodonaeus, and our English herbalists: Spigelius's Isagoge in rem herbarium will be of use, Wecker's Antidotarium speciale, Renodaeus for composition and preparation of medicaments . . . Read Morelli Formulas Medicas, Bauderoni Pharmacopoea, Pharmacopoea Augustana . . . Read Fallopius, Aquapendente, Paraeus, Vigo, Etc. See what chymistators do in their offices. Begin with Tirocinium Chymicum, Crollius, Hartmannus, and so by degrees march on . . . Having therefore, gained perfection in anatomy, betake yourself to Sennertius's Institutions, which read with care and diligence two or three times over, and assure yourself that when you are a perfect master of these institutions you will seldom meet with any point in physic to which you will not be able to speak like a man. This done, see how institutes are applicable to practice, by reading upon diseases in Sennertus, Fernelius, Mercatus, Hollerius, Riverius, in particular treatises, in counsels, and consultations, all of which are of singular benefit . . . Although I mention but few books (which, well digested, will be instar omnium), yet it is not my intent to confine you. If at one view you would see who hath written, and upon what diseases, by way of counsel and observation, look upon Moronus's Directorium Medico-practicum.

Sir Robert Sibbald (1641-1722), founder of the Royal College of Physicians of Edinburgh and the first Professor of Medicine there, was an ardent collector of books and manuscripts. His library was sold by auction on February 5, 1723, at his house in the Bishop's Land in Edinburgh, and the bulk of the collection was bought by the Faculty of Advocates for £342. 17s. The highspot of the collection was the manuscript copy of the "Conversations" between Ben Jonson and William Drummond of Hawthornden which went to the Advocates Library and which still remains the chief and most authentic source for the facts of Ben Jonson's life. The Sibbald sale catalogue is in the British Museum and also that of one which took place in 1707 when Sibbald sold some 900 volumes from his library.

According to Sir Robert Sibbald's own *Memoirs*[43] his love of books was evinced in his tenderest years. "While I was a child in my nurse's armes, my grandfather did observe my inclination for letters, for when I cryed and weept upon any occasion, I stilled upon the giving me the Psalms of Buchanan, he keept in his pocket." From the time he entered the High School of Edinburgh he spent any money he got on books and his habit of keeping to his study earned him the nickname of Diogenes in Dolio. In Paris he became well acquainted with Guy Patin, who lent

[43] *The Memoirs of Sir Robert Sibbald (1641-1722).* Edited by F. P. Hett (1932).

him books. During the time that he was physician to the family of James Drummond, 4th Earl of Perth (1648-1716), Chancellor of Scotland, Sibbald acted as his literary adviser, making him acquainted with "the curious books, expecially pieces of divinity, history, poemes, memoirs of ministers of state, and discoveries in philosophy." About 1682, Sibbald records that he gave "a presse with three shelfs full of books, to the Colledge of Physitians, amongst which were Galen's works, 5 voll Greek and five Latine, Hippocrates in Greek, of Aldus' edition, Gesner his history of animals, 3 voll, Paris bind, and some other valuable books."

Dr. T. P. C. Kirkpatrick[44] has published an interesting account of the library presented to Steevens' Hospital, Dublin, by Dr. Edward Worth (1678?-1733), and still preserved there.

The library of the celebrated Dr. Richard Mead (1673-1754) has been so often described that it may be dismissed very briefly.[45] The sale of his books commenced on November 18, 1754 and again on April 7, 1755 and lasted 57 days. The sale of his prints and drawings continued for 14 nights. The books produced £5,496.15s.0d., and total of all the sales (books, pictures, drawings, coins, medals, and antiquities) was £16,047.12s. The fine and rare books are so numerous that it is almost impossible to single out any for special mention. Bibliomaniacs such as Dibdin have rhapsodized about the Spira Virgil of 1470, Pfintzing's Tewrdanckh, 1527, Brant's *Stultifera Navis,* 1498, and the Aldine Petrarch of 1501, all upon vellum. The editio princeps of Pliny the Elder was bought by the King of France for £11.11s.0d. Pliny by Jensen (1472) sold for 18 guineas. The large paper Olivet's Cicero was purchased by Askew for 14 guineas and sold again at his sale for £36.15s.0d. Mead's copy of the *Epitome* of Vesalius on vellum, now in the British Museum, has been fully described by W. G. Spencer.[46]

Mead's collections were freely laid open to the public; the enterprising student and the experienced antiquary alike found amusement and a courteous reception. Well may Dibdin say "Ever renowned Richard Mead! thy *pharmacopoeal* reputation is lost in the blaze of thy *bibliomaniacal* glory!"

The sale of the great library of Dr. Anthony Askew (1723-1774),

[44] T. P. C. Kirkpatrick, *The Worth Library, Steevens' Hospital Dublin,* (Bibliog. Soc. of Ireland, Pamphlet No. 3, 1919).

[45] T. F. Dibdin, *Bibliomania* (1842) (364); J. F. Payne, *St. Thos. Hosp. Gaz.* 8 (1898) 1; *Brit. Med. Jour.* 2 (1900) 1508.

[46] W. G. Spencer, "The *Epitome* of Vesalius on Vellum in the British Museum Library," *Essays on the History of Medicine presented to Karl Sudhoff* (1924) 237.

classical scholar and bibliophile, which took place in 1774 and lasted twenty days, marks an epoch in the annals of book-collecting.[47]

The preface to the Sale Catalogue (which was sold at 1s.6d. small paper, 4s. the large) claims that it contains "without any doubt, the best, rarest, and most valuable collection of Greek and Latin books that was ever sold in England, and the great time and trouble of forming it will, it is hoped, be a sufficient excuse for the price put to it." In regard to Greek and Roman literature the collection was certainly unique of its day. Enriched with many a tome from the Harleian, Mead, Martin Folkes and Rawlinson libraries, as well as with numerous rare and splendid items from foreign collections, the books were sought after by almost every one then eminent in bibliographical research.

George III bought to the value of £300. De Bure spent £1500 on behalf of the King of France and other foreign collectors. Dr. Maty bought many books for the British Museum and the extensive purchases of the Rev. C. M. Cracherode eventually found their way into the national collection. Dr. William Hunter bought to the value of £500, his purchases including the *Anthologia Graeca,* editio princeps 1494 on vellum (£28.7s.0d.), the editio princeps of Plato's *Opera* 2 vols. folio, 1513, justly described by Dibdin as one of the finest productions of the Aldine press (£55.13s.0d.), Tewrdranckh's *Poema Germanica,* Nuremberg 1517, on vellum (£21.0s.0d.), Pliny *Natural History,* apud Spiram, folio 1469 (ed. prin.) (£43.0s.0d.), and Terentianus Maurus *De Literis, Syllabis et Metris Horatii,* Mediol. folio 1497 (£12.12s.0d.) This last is probably the only copy in existence. It originally belonged to Dr. Taylor, editor of Lysias and Demosthenes, who procured it from the Harleian Library for 4 guineas. All these books are now in the Hunterian Library at Glasgow.

There was a marked rise in the prices given for early books at the Askew sale. It was thought very remarkable at the time that the sale brought a guinea per article—one with another—of the 4015 articles of which the library was composed. As illustrating the rise in prices apparent towards the close of the eighteenth century, we may note that the Plinys of 1469 and 1472 which he bought at the sale of Martin Folkes, F.R.S., in 1750 for 11 guineas and £7.17s.6d. fetched £43 and £23 respectively at Askew's sale.

[47] Dibdin, *op. cit.* 383, 389, 390, 386; H. Barnes, "On Anthony Askew, M.D., F.R.S., and His Library," *Proc. Roy. Soc. Med.,* 9 (1915) 23.

The sale of the library of Richard Wright, M.D., F.R.S., Physician to St. George's Hospital, in April 1787 lasted twelve days.[48] The neatly printed catalogue is arranged in alphabetical order under the respective departments. This library contained "many of the scarcest editions of old English poets, novels and romances and also a singular assemblage of theatrical writers, including the rarest productions of the English Drama." Lots 1567 to 2091 comprehend the English Theatre and, says Dibdin, "exhibit almost everything that is rare, curious, and valuable in this popular department." Original editions of the Elizabethan dramatists abound. The catalogue contains such entries as Dekker 15 pieces £3.3s.0d., Heywood 26 plays £3.4s.0d., Marston 9 pieces £3.4s.0d., and Middleton 13 pieces £4.5s.0d. The first four folios of Shakespeare fetched £10, £2.9s.0d., £1.8s.0d. and £1.1s.0d. respectively!

The "elegant and valuable libraries" of Charles Chauncy, M.D., F.R.S., and F.S.A., and of his brother, Nathaniel Chauncy, Esq., were sold at auction by Leigh and Sotheby on April 15, 1790 and the 14 following days.[49] The Chauncys, able scholars and zealous bibliomaniacs, were the sons of Mr. Charles Chauncy, a wealthy linen-draper of Cornhill. Dr. Charles Chauncy died in 1777, aged 68, leaving his considerable fortune to his brother Nathaniel. Nathaniel at his death in 1790 left between his two daughters the sum of £120,000. The catalogue of the Chauncys' library lists 3153 lots and the sale realized £1650.11s.6d. Among the many notable items we find Ben Jonson's *Volpone,* a copy with the autograph inscription of the great dramatist to his worthy friend Mr. John Florio (1607), £4. Other notable items are Caius *Of English Dogges,* 1576, £5.10s.0d.; Cunningham's *Cosmographicall Glasse,* 1559, £5.15s.0d.; Virgil. Venice, 2 vols. fol. 1472, £65 ("this book formerly belonged to Lord Oxford and was bought by him of Andrew Hay for 160 guineas"); and Caxton's *Dictes and Sayingis of the Philosophers,* 1477, 16 guineas.

The library of Dr. John Monro (1715-1791), Physician to Bethlehem Hospital, which was sold in April 1792, contained some of the rarest articles in English literature and was also extremely rich in Italian books.[50] The books contained copious memoranda in the hand of Monro, showing him to have been an accomplished scholar and extremely well versed in all questions of rarity, price, and intrinsic worth.

[48] Dibdin, *op. cit.* 401.
[49] Dibdin, *op. cit.* 416; Clarke, *op. cit.* 425.
[50] Dibdin, *op. cit.* 417.

The great library of William Hunter (1718-1783) now preserved in the Hunterian Museum at Glasgow, contained more than 12,000 printed books, among which were many of the rarest specimens of early typography. His purchases at the Askew sale have already been referred to, and he obtained many of his first books from this source. Some of the copies on vellum from the presses of the early Venetian and Florentine printers are of unrivalled splendour. The Caxtons, Wynkyn de Wordes, and black-letter books were no less fine. The Hunterian library contained more than 600 manuscripts, many on vellum and beautifully illuminated.[51]

Although the introduction of book sales met with general acceptance, a few well-known collectors regretted the dispersal of "noble libraries." John Evelyn[52] refers with obvious disapproval to "the humour of disposing books sub hasta," and laments over a "diminution which in a day or two has scattered what has been gathering many years." So long as books escape the dangers of war, fire, and flood they will always outlive their owners, and their transfer from one collector to another is but an incident in their lives. Many books can be traced from sale to sale over a period of hundreds of years, having passed through the hands of generations of collectors. An ever-increasing number now find a permanent home in national and institutional libraries, and it will never again be possible for private individuals to form libraries comparable to those of the great bibliophiles of the past.

Most of our latter-day collections have been built up on specialized lines, and it is probable that more knowledge and discrimination are applied to book collecting than ever before. By the publication of catalogues and bio-bibliographies collectors such as Osler, Cushing, Klebs, and Fulton have shared their treasures with thousands and have opened up new paths in medical history. The compilation of a good bibliography is said to be one of the surest passports to lasting fame, and it is fairly safe to prophesy that the catalogue of the *Bibliotheca Osleriana* will be studied long after the *Principles and Practice of Medicine* shall have been relegated to the limbo of forgotten books.

[51] *A Catalogue of the Manuscripts in the Library of the Hunterian Museum in the University of Glasgow* (Glasgow 1908); Clarke, *op. cit.* 140.

[52] Evelyn, *Diary* (1902) III, 304.

Early Medicine in Kentucky and the Mississippi Valley: A Tribute to Daniel Drake, M.D.*

EMMET FIELD HORINE

THE MISSISSIPPI Valley region comprises more than a third of the total area of the United States. European explorers came as early as the sixteenth century but the tide of immigration did not begin until the last quarter of the eighteenth. And, for more than a hundred years, the ever increasing tide swelled into this "the *last* crucible into which living materials, in great and diversified streams, can be poured."[1]

The beginnings of medicine in Kentucky and the Mississippi Valley are veiled in their antiquity. Slight though the knowledge of the Indian medicine men concerning native herbs and roots may have been, it played a part in the medical development of the region. Some of the knowledge of the Indians was transmitted to and used by the early settlers. Even to this day in rural areas we find a surprising degree of dependence upon such simple native medicines.

The earliest medical men in the Mississippi Valley with any training which might be called formal were the physicians and surgeons who accompanied the Spanish and French explorers. Hernando de Soto (1496?-1542) unquestionably had medical attendants but a survey of the available accounts of his explorations fails to reveal any. It is apparent that the Frenchman, Radisson (1636?-1710), was unattended by physicians when he entered from the north. It seems probable that he crossed the divide which separates the region of the Great Lakes from the upper portion of the Mississippi Valley and was one of its earliest explorers. In describing his journey of 1658-1660, Radisson contrasts this region with Europe:

> . . . The Europeans fight for a rock in the sea against one another, or for a sterill land and horrid country. . . . Contrarywise those kingdoms are so delicious and under so temperat a climat, plentifull of all things, the earth bringing foorth

* Read before the Session on History of Medicine, Centennial Meeting, American Medical Association, Atlantic City, New Jersey, June 9-13, 1947.

its fruit twice a yeare, the people live long and lusty and wise in their way. What conquest would that bee att litle or no cost; what laborinth of pleasure should millions of people have, instead that millions complaine of misery and poverty! . . .[2]

The earliest medical man in this region known to us is one Jean Michel, *Surgeon.* He accompanied La Salle (1643-1687) and was one of the signers of the proclamation of 1682 by which France claimed the Mississippi Valley.[3]

Apparently, the first hospitals in what is now the United States were established in New Orleans. Martin[4] mentions the founding of a hospital by the Jesuits and Ursuline nuns as early as 1727 but furnishes no proof. However, by will of a sailor named Jean Louis, who died on January 21, 1736, after provision was made for debts, masses, and a few minor items, the residuum of his estate was given in perpetuity for the founding of a hospital in New Orleans.[5] This was the beginning of the Charity Hospital of Louisiana. A report on May 20, 1737 disclosed that five patients were then under treatment.

The earliest decree regulating medical practice in the Mississippi Valley was promulgated by an unusually able Spanish governor, Alejandro O'Reilly (1725-1794) on February 12, 1770 at New Orleans.[6]

The first care of a wise government being to delimit the rights of each individual and to watch over the welfare of its citizens, I have deemed it my duty to establish, as in all civilized states, the following regulations concerning the practice of medicine and surgery. . . .

The decree then defines what constitutes the practice of medicine, and indicates that neither the surgeon nor the pharmacist is permitted to encroach upon the duties of the physician except in his absence. Applicants to practise medicine and surgery must not only show their credentials, their books and instruments but, in addition, they were to submit to an examination before the king's physician. Surgeons were considered subordinate to physicians. Upon the onset of a contagious malady the surgeon must immediately notify the physician. The police were to be notified within twenty-four hours in cases of suspected poisoning as well as in all cases of wounds made by pointed or sharp-edged instruments or firearms. Failure to comply was punishable by fines or even severer penalties. Discreet women were to be instructed in the art of accouchement. Monthly conferences of the physicians and surgeons must be held for the purpose of discussing diseases and each member must discuss the stated subject in his turn. An interesting clause is the following: "He who shall have been

admitted as a single man shall be excluded at the end of fifteen months if he do not marry." Such comprehensive and enlightened regulations might well serve as a model in our day.

The lead of Louisiana in regulating the practice of medicine in the Mississippi Valley seems to have been maintained. In 1849 the comprehensive *Report of the Committee on Medical Education* of the American Medical Association disclosed[7] that even at that time few states had laws regulating the practice of medicine. Of twenty-six states for which the Committee had positive information only Louisiana, New Jersey, and Michigan in addition to the District of Columbia had regulatory medical laws. It was stated concerning Louisiana that: "No state in the Union is better protected against impositions of all kinds, in medicine, than this."

In 1780, four years after the Act of the General Assembly of Virginia[8] dividing Fincastle county into three parts: Kentucky, Washington, and Montgomery counties, another act was passed which marked the beginning of public education west of the Alleghenies. This act[9] merely set aside certain escheated Tory lands (8,000 acres) in Kentucky for the endowment of a *seminary of learning* which later (1798; it is unnecessary to record the details here) became Transylvania University[10] located in Lexington. In 1799 under the direction of the first acting President, the Rev. James Moore of the Episcopal Church, the trustees at their first meeting instituted medical and law departments in addition to the academic. Two professors, Drs. Samuel Brown (1769-1830) and Frederick Ridgely (1757-1824), were then elected to the Medical Department without designation of the particular branches they were to teach.[11] In due time these men accepted, were qualified by taking the necessary oaths before the Board of Trustees, and thus became the first professors of medicine west of the Alleghenies. Both Drs. Brown and Ridgely acted as preceptors to private pupils in their offices as did every capable physician throughout the United States. Such teaching was clearly unofficial.

On December 11, 1799, Dr. Brown was authorized[12] to expend the sum of five hundred dollars (a recent author[13] has increased it to $5,000!) for the purpose of procuring a medical library. The bill[14] for the books shows that Dr. Brown, after adjustment for damaged books and an agreed reduction, spent a total of £71/17/5, which was well within the allotted sum. Eighty-two volumes were purchased including Hamilton's *Midwifery,* Cullen's *Synopsis,* Hunter on *Venereal Diseases,* Rosenstein [*i.e.,* Rosén von Rosenstein] on the *Complaints of Children,* Bergman's *Chem-*

ical Essays, Rush's *Essays,* Jackson's *Fevers,* Wallis' *Sydenham,* Poulteney's [*i.e.,* Pulteney] *Botany,* Desault's *Surgery,* Buffon's *Natural History,* Bailly's (*sic*) *Morbid Anatomy,* etc. Many of these volumes are to be found in the historic Transylvania Library which is still intact.

The early records of the University are meagre and from them no idea of the number of students in any of the departments can be ascertained. Apparently the first degree authorized on April 7, 1802, by the Board of Trustees was that of Bachelor of Arts conferred upon Robert R. Barr.[15] This was the first degree granted in the Mississippi Valley. In the Medical Department one must infer that no classes were held despite attempts to organize in 1801 and again in 1805 when the Presbyterians obtained control. In 1809, a more concerted effort was made to establish an active medical faculty with the appointment of Drs. Benjamin W. Dudley (1785-1870) as Professor of Anatomy and Physiology; Joseph Buchanan (1785-1829), Professor of the Institutes of Medicine; James Overton (1785-1865), Professor of Materia Medica and Botany; Elisha Warfield (1740-1818), Professor of Surgery and Midwifery.[16] The records of the trustees disclose that Drs. Buchanan, Overton, and Warfield accepted their appointments and took the oaths prescribed. There is no record of Dr. Dudley's acceptance and this attempt to organize the medical department also resulted in failure.

Despite the failure of the faculty to organize and commence their lectures, the appointment of Joseph Buchanan to a professorship led to the publication of the first systematic treatise on materialism written by a native of the United States. Dr. Buchanan, a Virginian by birth, had had but fourteen months' schooling when he came to Lexington, Kentucky in 1804. He became a private pupil of Dr. Samuel Brown and as a result of such training began the practice of medicine after Dr. Brown's departure for New Orleans in 1806. Because of "his moral conduct and literary attainments" Dr. Joseph Buchanan was granted the honorary degree of Bachelor of Arts on April 5, 1809.[17]

Buchanan not only studied medicine assiduously but digested Locke, Hartley, Hume, and Erasmus Darwin with the result that he accepted materialism. In 1809, preparatory to assuming the duties of his professorship, he wrote a series of introductory lectures. When the plans for the medical department miscarried, Buchanan decided to make some additions to his lectures and publish them with the title: *The Philosophy of Human Nature.*[18] To have been written by a backwoodsman of twenty-

seven the book is remarkable. Riley states: "Without reading too much of the future into the past, it may be said that Buchanan has anticipated to a considerable degree the modern notions of volition . . . and performed a real service in his insistence on the indissoluble connection between the psychical and physical processes. For this he may be called the earliest native physiological psychologist."[19] Buchanan gave up his medical career in order to found a school based on Pestalozzian methods. This venture was unsuccessful and he then became an editor of newspapers first in Frankfort, Kentucky, later in Cincinnati, Ohio. He finally removed to Louisville where he experimented, among other things, with a steam automobile and helped to establish *The Louisville Focus* of which he was one of the editors until his death in 1829.

Without bearing any relationship whatever to the efforts made at Lexington to establish a medical school there occurred, in 1809, at nearby Danville, Kentucky, an event which was to prove epochal. This was the successful ovariotomy performed by Ephraim McDowell (1771-1830) which initiated the era of abdominal surgery. McDowell was not only a skillful general surgeon but had a state-wide reputation as a lithotomist. In this latter operation, however, he was ultimately overshadowed by Dr. Benjamin W. Dudley of Lexington who is said to have performed 225 lithotomies with but three fatalities. Among early Kentucky surgeons should be mentioned Walter Brashear (1776-1860) of Bardstown who performed the first successful hip joint amputation in 1806, and Charles McCreery (1785-1826) of Hartford, Kentucky, who, in 1813, did the first successful excision of the clavicle.

Further efforts to organize the Medical Department of Transylvania were unsuccessful in 1815 and equally so in 1816. However, an unofficial course of medical lectures[20] was begun in Lexington on November 13, 1816 before a group of about sixteen students. Dr. James Overton lectured on the theory and practice of medicine, Dr. B. W. Dudley on anatomy and surgery, and Dr. James Blythe (1765-1842) on chemistry. Dr. William H. Richardson (died 1845) was to have taught obstetrics and the diseases of women and children but, after only two lectures, announced that his many business engagements would prevent continuation of his course. Eleven students then sent a petition[21] to the trustees complaining bitterly that the lectures on obstetrics were not being delivered. The trustees replied that the lectures had been inaugurated unofficially, that two of the teachers were not even professors in Transylvania,

and that no rules had ever been prescribed for the government of the medical department.[22] This statement unequivocally controverts the recurring assertions that it was in actual operation at this or an earlier date. The errors in regard to the Medical Department of Transylvania seem to be based on the somewhat inaccurate and only partly documented history by Robert Peter.[23] It was not until the fall of 1817 that the medical faculty was fully organized and accredited courses were begun by the following teachers: Benjamin W. Dudley, Professor of Anatomy and Surgery; James Overton, Professor of the Theory and Practice of Medicine; Daniel Drake (1785-1852), of Cincinnati, the first medical student west of the Alleghenies and an 1816 graduate of the University of Pennsylvania, Professor of Materia Medica and Medical Botany; William H. Richardson, Professor of Obstetrics and Diseases of Women and Children; and James Blythe, Professor of Chemistry.

Dr. James Overton was elected dean of the medical faculty[24] and delivered his introductory lecture "at 12 o'clock on Monday, November 10th [1817] in the Market Street Presbyterian Church." The other members of the faculty delivered their introductories on succeeding days. Each professor's ticket for the session was fifteen dollars for which three lectures a week were to be given. Twenty students were in attendance and in March, 1818, there was a single successful candidate for the degree of M.D., John Lawson McCullough (1793-1825), a native of Lexington who had, in 1809, received an A.B. from Transylvania. Dr. McCullough, for a brief period, served as a surgeon in the Army and then located at York, Illinois where he practised until his death, January 20, 1825.[25]

Drake resigned immediately after the close of the 1817-1818 session. Probably the inability to secure a satisfactory occupant of his chair prevented the resumption of lectures in the autumn of 1818. The control of the conservative Presbyterian Church was sufficiently weakened in 1817 to permit the election of the talented and liberal Unitarian minister of Boston, Horace Holley (1781-1827), to the Presidency of Transylvania.[26] He accepted on April 7, 1818 and was inaugurated on the 19th of the following December. Within a short time Holley reorganized all departments, obtained able teachers, and transformed Transylvania into a flourishing university. The Lexington of this period has often been alluded to as the "Athens of the West."

Returning to Cincinnati and his practice in 1818, having proved beyond question his unusual teaching ability, Drake began a series of

public lectures on botany. The editorial comment of *The Western Spy*[27] is interesting:

> A course of Botanical Lectures for the coming season, was commenced on Friday evening 8th inst. [May, 1818] by Dr. Drake, with an introductory Lecture of much interest. It is truly gratifying to see so numerous and respectable an audience, at the first attempt of the kind in the Western Country. . . .

In association with Dr. Coleman Rogers (1781-1855) and the Rev. Elijah Slack (1784-1866), Dr. Drake announced[28] on May 27, 1818, the plans for a comprehensive course of medical instruction for private pupils. Dr. Rogers taught surgery and surgical anatomy, Dr. Drake materia medica and the practice of physick, the Rev. Dr. Slack chemistry and pharmacy. These courses of lectures began early in November, 1818, and terminated the first of March, 1819. More students came from a distance than were ever assembled for a similar purpose in the west.

The success of this undertaking prompted Drake immediately to inaugurate plans for the incorporation of a medical college. By personal solicitation before the General Assembly he succeeded in having The Medical College of Ohio duly incorporated[29] on January 19, 1819. This Act made Daniel Drake, President, with Coleman Rogers, Vice-President, and Elijah Slack, Registrar and Treasurer. In accordance with the provisions of Section 8, the following faculty was appointed: Daniel Drake, Professor of the Institutes and Practice of Medicine; Samuel Brown, Professor of Anatomy; Coleman Rogers, Professor of Surgery; and Elijah Slack, Professor of Chemistry and Pharmacy. The faculty constituted the governing body of the institution and this provision later resulted in disruption.

At the same session of the Ohio General Assembly, Drake was instrumental in having incorporated Cincinnati College[30] with power to "grant and confer on any candidate, in such form as they may direct, all or any of the degrees that are usually conferred in any college or university within the United States." This college was to manage the affairs of the Cincinnati Lancaster Seminary of which Drake was a trustee, as he was also of the Cincinnati College. Drake's activities at this time for the advancement of Cincinnati made him its foremost citizen and physician. In addition to being the leader in the founding of the institutions just mentioned, he was one of the managers of the Western Museum, a Vice-President of the Humane Society, a Director of the United States Branch Bank, President of the Cincinnati Library Society, and a member of the

Standing Committee of the Cincinnati Society for Promotion of Agriculture.[31]

Before his appointment to a chair in The Medical College of Ohio by the General Assembly on January 19, 1819, Dr. Samuel Brown had agreed to accept the post if it were offered. He was immediately notified of the incorporation of the College but made no reply until eight months later when he declined, intimating that he had obtained a better offer from President Holley of Lexington. It was then too late in the year to secure the services of a competent teacher and Drake's cherished hope of opening his school in 1819 was shattered. To make matters worse, Dr. Coleman Rogers continued to be friendly, even laudatory, toward Dr. Brown. This, to the intense and sensitive Drake, was nothing short of treachery. A controversy arose which resulted in the expulsion of Rogers from The Medical College of Ohio by vote of Drake and Slack.

Thwarted in the initial attempt to open the College, Drake continued his efforts to secure a competent faculty. On August 20, 1820, he was able to announce[32] that the school was organized with the following teachers: Daniel Drake, M.D., Professor of the Institutes and Practice of Medicine, including Obstetrics and the Diseases of Women and Children; Jesse Smith, M.D., (1793-1833), Professor of Anatomy and Surgery; Benjamin S. Bohrer, M.D., (1788-1861), Professor of Materia Medica and Pharmacy; Elijah Slack, A.M., assisted by Mr. Robert Best (1790-1830), Chemistry. Hospital training became an integral part of the instruction of the students for Drake believed:

> The laboratory is not more necessary for the study of chemistry, or a garden of plants for the study of botany, than a hospital for the study of practical medicine and surgery. The time has passed by, when students will flock to men of genius (as they once flocked to Boerhaave) for the purpose of listening to expositions of theory, or to be amused with creations of imagination. The school which is not based on a hospital, may have learned and able professors; but the results of their teaching can never be satisfactory to the student, who seeks to make himself a good practical physician and surgeon.[33]

In 1821 Drake was instrumental in persuading the General Assembly of Ohio to establish the Commercial Hospital and Lunatic Asylum at Cincinnati. Initially the plan to found this institution met with considerable opposition. However, through the efforts of Drake's friend, Gen. William Henry Harrison, the law creating the hospital was enacted. This was the first hospital in the Mississippi Valley connected with a medical school and founded for the purpose of teaching. Its founding enactment

specifically stated that all medical and surgical attendance was to be rendered by the professors of The Medical College of Ohio and that medical students were to observe the treatment employed.[34]

The matriculation fee, which included admission to the hospital and use of the library, was five dollars, while the price of each professor's ticket was twenty dollars. This, the second medical school west of the Alleghenies, opened with a class of twenty-four students on November 11, 1820, when Daniel Drake, the President, delivered *An Inaugural Discourse on Medical Education*.[35] In this address he advocated an extension of the course of medical study to five months. A four months' session was the practice of all other existing medical colleges in the United States. A century in advance of his time he insisted that the student not confine his researches to the structural changes alone but ". . . must extend them to the mind itself, and to its operations and effects." The necessity for preliminary education was stressed and an especial plea made for the classics:

> So deeply impressed are the Faculty of this institution with the neglect of these studies, and the importance of them to the advancement and elevation of the profession, that they have offered an annual prize medal for the best inaugural thesis in the Latin language; and hope by this measure to excite among the students of the west an emulation for excellence in classical literature.

Medical educators of today would do well to acquaint themselves with this discourse on medical education, as well as with his more extended work on the same subject.[36]

In 1821 a fifth member of the faculty was secured, the erudite Dr. John D. Godman (1794-1830) of Philadelphia who accepted the Chair of Surgery and Demonstrative Obstetrics. Unfortunately the session of 1821-1822 was one of dissension which resulted in the resignation of Drs. Godman and Bohrer. At the faculty meeting which followed these resignations, transaction of routine financial matters was the first order of business. Then there followed an ominous silence after which Dr. Smith arose and addressed President Drake announcing that he had a resolution to offer as follows: "Voted that Daniel Drake, M.D., be dismissed from The Medical College of Ohio." Again silence, broken by the voice of the President asking if there were a second to the resolution. The second plotter (Prof. Slack) arose and said: "I second the motion." The question was put and was carried by the votes of the two voting members present, both of whom owed their positions on the faculty to Drake. With quiet

dignity the deposed President expressed his thanks and departed. In Drake's *Rise and Fall of The Medical College of Ohio,*[37] which is a dramatic and entertaining serio-comic description of the early days of this institution, there appears a vivid recital of the above incident. The citizens of Cincinnati were so indignant that within a week Drake was reinstated but he promptly resigned.

In 1823 Drake was offered his former chair at Transylvania University and he accepted. On November 7, 1823, he delivered *An Introductory Lecture on the Necessity and Value of Professional Industry*[38] which revealed further ideas on medical education. I quote from this address:

> The *pupil,* who dismisses the subject of his researches with the book that guided him, does not deserve the honorable epithet of *student.* When he is fatigued with acquiring, he should pass to rumination; and when that which has been received is appropriated, he will be prepared to return to the fountain, in ceaseless and delightful alternation.

During the first half of the 1824-25 session, Drake not only lectured on materia medica and medical botany but, in the absence of Dr. Brown, delivered the lectures on the theory and practice of physic. At the close of this session, Brown left Kentucky permanently and Drake was then transferred to his chair. Dr. Drake was elected dean of the medical faculty and during his incumbency Transylvania had enrolled the largest medical class in its history (281 in 1825).

The academic and law departments were equally flourishing and recognized as outstanding throughout the United States. However, even before Holley's arrival in Lexington, certain reactionary elements in Kentucky had plotted against him.[39] As the remarkable success of Holley's administration became more evident, the illiberal religious groups redoubled their efforts. Dozens of pamphlets, veiled and sometimes openly defamatory letters to the newspapers, memorials to the Legislature of Kentucky, and even sermons from the pulpits were used to discredit him. Spies entered his home and reported that Dr. Holley was accustomed to making "frequent and sumptuous entertainments; while statuary, painting, music, cards, and dancing attracted the young and the gay."[40] The persecution of Horace Holley reminds us that bigotry was then, and may still be, as fierce as in the days of the martyr Servetus. Holley, on March 14, 1827, retired as President of the University, and Daniel Drake resigned his Professorship of the Theory and Practice of Medicine on March 19, 1827. It seems significant that Drake should have resigned

so shortly after Holley. Even more significant was the gradual decrease in the number of students in succeeding years until in 1859 the medical department ended its existence. One important factor which contributed to disintegration of the medical school of Transylvania was a disruption of the faculty in 1837 which resulted in the opening of the Louisville Medical Institute (chartered originally in 1833), now the School of Medicine, University of Louisville.[41]

When the medical school of Transylvania closed, it unquestionably possessed as excellent equipment in the way of anatomical preparations, manikins, chemical apparatus, etc. as could be found in any school in the United States. Its medical library alone, exclusive of reprints, theses, and pamphlets, numbered 6,660 volumes!

The Transylvania School of Medicine during its existence (1817-1859) enrolled a total of 6,456 students. Of these, 1,881 were awarded the degree of M.D.[42] Students were attracted from all sections of the Mississippi Valley, as well as from the southern and some of the eastern states. Many names distinguished in American medicine appear on this roster. Among these the following may be mentioned: Luke P. Blackburn (1816-1887), prominent epidemiologist and Governor of Kentucky; Thomas Holley Chivers (1809-1858), poet and physician; Albert Kellogg (1813-1887), physician and pioneer California botanist; Crawford W. Long (1815-1878), who was at Transylvania for his first course of medical lectures in 1837; Henry Miller (1800-1874), first Professor of Obstetrics in the Louisville Medical Institute, author of a widely accepted textbook and President of the American Medical Association in 1859-1860; John W. Monette (1803-1851), physician and historian; Lewis A. Sayre (1820-1900), New York orthopaedic surgeon, and Lunsford P. Yandell (1805-1878), physician, paleontologist, medical educator, and editor. In the academic and law departments there were many persons of equal distinction: Jefferson Davis (1808-1889), a student in 1821-1824, President of the Southern Confederacy; Stephen Fuller Austin (1793-1836), founder of Texas; Matthew Harris Jouett (1787-1827), the portrait painter; and James Speed (1812-1887), lawyer, friend of Lincoln, and Attorney General of the United States.

During its first few decades, and despite almost constant faculty dissension, The Medical College of Ohio attracted many students from a wide territory. Its equipment and library were not comparable to those of Transylvania and the faculty members were not so well known. Drake,

its founder, was in and out of the faculty many times but, whatever his position, he always showed a paternal interest.[43]

It is quite apparent that these two medical schools exerted a profound influence in elevating medical standards in the Mississippi Valley. Before the advent of the railroad, weeks were required for the crossing of the Alleghenies. Thus the strategic position of these schools in the west meant that thousands of students had easy access to medical lectures which otherwise would have been denied them. Because of the preceptorship plan in vogue at the time, these numerous students became themselves teachers of others with an ever widening circle of influence. In addition, the graduates of these schools helped found medical colleges throughout the western country: St. Louis, Nashville, Memphis, Evansville, and even in California (Toland Medical College, which was founded by a graduate of Transylvania). The ever alert and observant Drake recognized the evils that could and did arise from the establishment of too many poorly equipped medical schools:

> Everywhere I go, our brethren are crying out against the multiplication of medical schools. But to what end? Who can arrest it? The medical school diathesis of the profession and the States is like some morbid actions 'self-limited' but must be left to correct itself.[44]

This was one instance in which Drake was mistaken because the evil of too many medical schools in the United States had not corrected itself even after sixty-six years. It required the Flexner report[45] to the Carnegie Foundation for the Advancement of Teaching followed by intelligent action on the part of the American Medical Association to eradicate the abuses.

A final factor of importance in the development of medicine in the Mississippi Valley must be mentioned. In 1818-1819 Drake sought subscribers for a medical journal and obtained over two hundred. Unfortunately his manifold activities at this period prevented the start of the proposed publication. In March 1822, Dr. John D. Godman, with the backing of Mr. John P. Foote, a Cincinnati publisher, issued the first number of *The Western Quarterly Reporter of Medical, Surgical and Natural Science.* The reception of this publication, the first in the west, was most encouraging, a tribute to Godman's ability and to the need for a medical journal. After publication of the sixth issue Godman returned to Philadelphia, and Drake, who had then accepted a second call to Transylvania, expected to transfer the publication to Lexington. Other

duties and the inability to obtain a publisher prevented continuance of this journal. On April 1, 1826, Drs. Guy W. Wright and James M. Mason began the publication at Cincinnati of a semi-monthly, *The Ohio Medical Repository of Original and Selected Essays and Intelligence*. This journal was merged in April, 1827 with *The Western Medical and Physical Journal* under the editorship of Drs. Daniel Drake and Guy W. Wright. "Drake's Journal," as it was called, was transferred to Louisville in 1839 and merged with *The Louisville Journal of Medicine and Surgery* under the title: *The Western Journal of Medicine and Surgery*, the first issue appearing January, 1840. This important and widely influential journal was continued until 1855, though Drake retired from the senior editorship of it in 1848.

The fourth medical periodical to be established in the west was begun at Lexington, *The Transylvania Journal of Medicine and the Associate Sciences* in February, 1828 under the editorship of John Esten Cooke (1783-1853) and Charles Wilkins Short (1794-1863). The major portion of the material contained in this periodical was contributed by the teachers in Lexington. It was discontinued March, 1839.

These early western journals kept the physicians of the region well informed relative to the advances in medicine. They ranked with the best of the eastern publications. Drake's editorials and book reviews were always interesting and many of his numerous original articles received laudatory comment and quotation in the eastern journals. Samuel D. Gross (1805-1884) contributed a number of outstanding essays to Drake's journal as well as his report of his early experimental work relative to wounds of the intestines.[46] The Transylvania publication seems to have had a less extensive circulation than Drake's periodical.

The western schools attracted the best teaching talent of the country as is evidenced by such names, among others, as the following professors: Austin Flint, Sr. (1812-1886); Elisha Bartlett (1804-1855); Willard Parker (1800-1884); Benjamin Silliman, Jr. (1816-1885); Charles Caldwell (1772-1853); Nathan R. Smith (1797-1877); and Joseph Nash McDowell (1803-1868). Of the western physicians Daniel Drake was the first to be called to a professorship in an eastern school. He distinguished himself as Professor of the Theory and Practice of Medicine in Jefferson Medical College for the session of 1830-1831. However, his love for the west and his ambition to found an outstanding medical college at Cincinnati led him to resign his position at Philadelphia after one term. Samuel D. Gross, colleague and intimate friend of Drake, accepted in 1850 the Professorship

of Surgery in the University of the City of New York. He remained only one session and then returned to his former position in Louisville because of its greater possibilities. Austin Flint, Sr. was called from Buffalo, New York in 1852 to the Chair of the Theory and Practice of Medicine in the University of Louisville, which position he held for four years.

As we review the devotion of these leaders to the ideals of medicine, their great industry, the breadth of their interests, their versatility and their accomplishments, their greatness must be conceded. It is not surprising that such men attracted and strongly influenced a host of students in their preparation to meet the needs for medical care of the rapidly growing population of the Mississippi Valley. The more careful the scrutiny of the early medical history of Kentucky and the Mississippi Valley, the more we must appreciate Daniel Drake. An intensely patriotic citizen interested in the welfare of his fellow man, an original thinker and teacher, as well as author and editor, a zealous and assiduous worker, a genius with lofty ideals and laudable ambition, he stands preëminent.

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Biography of Dr. Johann Peter Frank

Imperial and Royal Court Councillor, Hospital Director and Professor of Practical Medicine at the University in Vienna, Member of various learned Societies.

WRITTEN BY HIMSELF

Translated from the German, with an Introduction and notes, by

GEORGE ROSEN

(Concluded)

AFTER MY return to Bruchsal my vexations increased daily, so that I decided to end them at the first opportunity. I did not have to wait long. Soon I received an invitation to accept a post as professor of physiology and medical police at the University in Mainz. Hardly three weeks later I was invited to take over the position vacated at Pavia in Italy by the famous Tissot,[14] as professor of medical practice at a salary of 3000 florins and with a free, well-furnished dwelling. The deceased Stoll[15] had proposed me to Prince von Kaunitz,[16] although I neither knew him personally nor had ever corresponded with him. The Prince awaited the return from Italy of His Majesty Emperor Joseph II[17] in order to obtain the final approval. As the final conclusion of this affair was greatly delayed owing to the absence of the monarch, and the Prince-Bishop in the meantime had heard something about this matter from Vienna, I feared that he might once again surreptitiously frustrate my design. At this time having also received a call to the professorship of medical practice at the famous University of Göttingen[18] which had been vacated by the meritori-

[14] Simon André Tissot (1728-1797), a native of Lausanne, best known for his book on masturbation, and for his popular work on hygiene, *Avis au peuple sur sa santé* (1762).

[15] Maximilian Stoll (1742-1787), one of the outstanding teachers of the Old Vienna School, succeeded to de Haen's chair in 1776, where he remained for ten years.

[16] Prince von Kaunitz was Austrian Ambassador in Paris 1750-1753, and then became Reich Chancellor in Vienna. It was he who conducted Austria's diplomatic struggle against Friedrich II of Prussia.

[17] Joseph II (1765-1790). Since 1780 sole ruler of the Austrian lands. Before that co-ruler with his mother Maria Theresa.

[18] The University of Göttingen was founded in 1737 by George II of England. See Götz von Selle: *Die Georg-August Universität zu Göttingen* 1737-1937, Göttingen, Vandenhoeck and Ruprecht, 1937.

ous Baldinger,[19] I wrote to Vienna that if it were not possible to receive confirmation of my appointment as professor at Pavia in fourteen days, I would have to accept the post at Göttingen. The time in which I had to reply definitely to this last call had already passed. The honor which was shown to me as a Catholic by this call from a Protestant university, the outstanding reputation of this university, the pleasure of being able to remain in Germany, the excellent library which I would be able to use for my work that had been started—all this inclined me to accept the proffered post. His Majesty the King of Great Britain appointed me to a position as Court Councillor, and as a regular member of the Royal Society of Science at Göttingen. The salary which was offered me as professor of medical practice consisted of only 800 *Thaler* from tuition fees, plus 40 *Thaler* of so-called *Lizent* money. According to the regulations, in each faculty only three professors divided the revenues among themselves, so that I was also promised the first position that would become free in the medical faculty.

As soon as I had arranged this matter, I resigned my position with the Prince-Bishop of Speyer. He did not accept my resignation immediately, but wrote to me that in view of my conduct toward him he had found it necessary to write to the King of England and that I would have to await the reply from London. I promised to do so, but leaving my family in Bruchsal I went immediately to Göttingen to explain more clearly the complaints of the Prince-Bishop. In eight days I returned. Too late I found here a very honorable letter from Prince Kaunitz, together with a diploma as professor at Padua, in which I was assured that I would have all the advantages that Tissot had formerly enjoyed. But as I was now appointed at Göttingen I had to send the diploma back with my thanks. As I later learned, the Bishop had complained to the King that his servants were being enticed away from their work. The King sent the Bishop's letter to his government at Hannover. As the Bishop received no reply for some time, he no longer opposed my departure. I arranged this immediately and on May 6, 1784 arrived with my family in Göttingen. On the 25th of this month I entered upon the duties of my position with a public address, which was later printed in the third volume of my *Delectus opusculorum medicorum* under the title:

[19] E. G. Baldinger (1738-1804), professor of medicine at Göttingen, also occupied chairs at Jena and Marburg. In 1775, he began the publication of a journal, *Magazin vor Ärzte*, devoted to problems of medical polity. He had a private library of 15,559 volumes.

9. *Oratio inauguralis, de instituendo ad praxim medico,* Professionis medicae adeundae causa die XXV. Maji 1784 Göttingae habita.

At the same time I announced my new appointment through the following work:

10. Johannis Petri Frank, Phil. et Med. Doct. Magnae Britanniae Regis Consiliarii Aulici et medicinae practicae in Academia Göttingensi Professoris P. & O. &c. *Prolusio de larvis morborum biliosis.* Göttingae, 1784.

Soon thereafter when the direction of the Clinical Institute was turned over to me, I informed the learned public of my plan in a separate work:

11. Johann Peter Frank's, der Arzneywissenschaft und Weltweisheit Doktors, Sr. Königl. Majestät von Grossbrittanien Hofrathes, der praktischen Arzneywissenschaft ordentlichen, öffentlichen Lehrers auf der Universität zu Göttingen, Mitgliedes der Königl. Göttingischen, und der Kurmainzischen Akademien der Wissenschaften, *Ankündigung des klinischen Instituts zu Göttingen, wie solches bey seiner Wiederherstellung, zum Vorteile armer Kranken, und zur Bildung praktischer Aerzte eingerichtet werden solle.*

The expression "restoration" [*Wiederherstellung*] was immediately noted with antagonism by some. My mistake was unintentional. Since Professor Baldinger's departure, the clinic had been run by a young doctor, but this remained unknown to me. To be sure, I should have informed myself better.

Soon thereafter I sent to the Royal Society of Science several observations that I had made. These were included in the eighth volume of the Göttingen Commentaries and bear the title:

12. *Observatio I. de hydrope cum vasorum ossificatione conjuncto. Obs. II. de haemorrhagia perforationem calvariae inhibente. Obs. III. de partu difficili ob hydropem intestinorum.* 4to. These had hardly been completed, when I wrote the following dissertation under someone else's name:

13. Joh. Lukianovitz Danielevsky. *Dissert. inaug. de Magistratu, medico felicissimo.* Göttingae, 1784. 4to.[20]

[20] For an English version of this dissertation see "The Civil Administrator—Most Successful Physician" . . . translated from the Latin with an introduction by Jean Captain Sabine, *Bull. Hist. Med.*, 1944, *16*, 289-318.

In 1784, I also wrote several reviews of practical books for the *Göttingische gelehrte Anzeigen.*

Besides my lectures on special therapy, I also lectured on physiology and pathology, according to Gregory; on general therapy according to the same author; and on medical police and forensic medicine on the basis of my own notes. At the same time I attended to the work of the clinic twice daily, not in a hospital, but rather in the scattered huts of the poor. I should not have assumed so great a burden so soon after my arrival in Göttingen. For about twenty years already I had attended at the bedside, noted all my most important observations, reflected on them, and during this period I had advanced with my science. Although I diligently read the Ancients, I took pains not to overlook any writings of the Moderns that seemed to be in the least significant, and I carefully noted everything that seemed to deserve it. However, before holding so many lectures, I should first have spun the thread for them. Soon my health suffered, in part as a result of the excessive activity, in part due to the sudden change from my previous way of life in a temperate climate. I lost all my digestive power, and vomited violently three or four times daily, which left me very weak. Had I entered upon my duties with a little less haste, all this would not have happened. The government at Hannover treated me most nobly, and all the professors behaved in the friendliest fashion toward me. The fact that my religion was not that of the majority made so little difference that when my wife was close to her confinement the estimable Protestant pastor of the parish in which I lived offered of his own accord to obtain for me from Hannover permission to call a Catholic priest to baptize my child. I thanked him for an act so worthy of imitation, and as my religion permitted it, I had my daughter Elizabetha, born on May 30, 1784, baptized by this Protestant clergyman.

Meanwhile, my health became worse. Furthermore, I saw no possibility of getting a hospital with many patients to which I could take my students, and where I would have better clinical facilities for teaching, so at the close of the second academic semester I accepted the post, which was still available, as professor at the medical school and clinic at Pavia, under the same conditions that the esteemed Tissot had enjoyed there.

On March 25, 1785, I departed from Göttingen for Italy, travelling by way of Vienna. In the Imperial capital, after having twice, at the

Emperor's command, visited the General Hospital, which had been newly erected only a year ago, and having observed everything there very carefully, I had the good fortune to be presented to His Imperial Majesty, Joseph II. This wise and beneficent monarch asked me whether I was satisfied with the hospital that I had just seen. "It is excellent," I replied, "and in seeing it I have to a certain extent reconciled myself to the idea of a large hospital." "What might be your objection to such an institution?" "The fact that such a large mechanism rarely operates properly," was my reply. "But it works!" said the ruler, well aware of the infinite care which he bestowed on this institution that he had founded. "Certainly," I said, full of confidence in this great Prince's love of truth, "it works as long as it has such a great power to set it in motion!" My forwardness was received favorably.

A month later, on May 9, I left the capital. Owing to the long winter of this year, I saw hardly a trace of the coming spring on my trip to Pavia. Hardly had I arrived at Bolzano, however, when I saw the vines blooming and the peasants occupied in harvesting the hay. In the greatest summer heat, on May 18, I finally arrived safely in Pavia. The academic year, which terminates there at the end of June, was almost over. Since it was no longer worth the effort to start my lectures now, I took over only the clinic at first. The influx of physicians and curious individuals was large; but, on the other hand, I found that since Tissot's departure almost half the students, especially all the foreign auditors, had been lost, and only approximately forty-four students of the medical school remained.

On June 12, His Imperial Majesty, accompanied by His Royal Highness, Grand Duke Leopold of Tuscany, arrived unexpectedly in Pavia. After the monarch had visited the University and had been received by all the professors, their Highnesses went to the hospital and commanded me to follow. In a ward for sick women the Emperor noticed a small side door, and asked me about it. I said that it led to two small rooms for patients. As the Regent wished to enter, I reported this spot was very unhealthy, and full of contagious fever cases. "That is of no import," replied the philanthrope, and entered the room. At the sight of this dreadful spot, the monarch turned to me, exclaiming: "Frank! Is it possible that people are put in here? This must be demolished immediately!" This order had to be carried out the very next day. Following

this the Emperor visited the whole hospital and informed himself about the slightest details. Hardly six weeks had elapsed when Imperial orders arrived from Vienna to remedy all the defects that the Monarch had noticed, even the most minute, and indicating specifically what was to be done in each case.

At the very beginning of the vacation period which lasted four months I was attacked by a rather violent fever. For my convalescence, which was troublesome in such unaccustomed heat, Count von Wilzeck, Imperial and Royal Minister at Milan (to whose patronage and support over a period of ten years I owe everything), lodged me at Casteggio in a fine house belonging to the hospital at Pavia. It was situated on the opposite, healthier side of the Po River, at the foot of the Appenines. In a short time I had regained my strength, and occupied myself with the preparation of my inaugural address:

15. *Sermo academicus, de Civis medici in Republica conditione atque officiis ex Lege praecipue erutis, quam professionis medicae adeundae causa die XXIV. Novembris* 1785 *recitabit Joannes Petrus Frank, Med. & Philosoph. Doct. pridem in Regia Göttingensi, nunc in R. Ticinensi Academia, theoriae practicae, et medicinae clinicae Professor* &c. Ticini 1785 apud Petr. Galeatium. 8vo.

Then I prepared for the benefit of my students a collection of the best polemic treatises that had been published in Latin at German universities, which I annotated and in which I included my Latin publications. The first volume of this work appeared in 1785 under the following title:

16. *Delectus opusculorum medicorum antehac in Germaniae diversis Academiis editorum, quae in Auditorum commodum collegit, et cum notis hinc inde aucta recudi curavit Joannes Petrus Frank* &c. Vol. I. Ticini in Typographeo Petri Galleatii. 1785. 8vo.

I continued this collection in the following years and closed it in 1793 with the twelfth volume. It was reprinted at Venice and in part at Leipzig. In addition to the works already cited, I included the following of my essays prepared at Pavia.

17. Jo. Pet. Frank, *Oratio academica de Vesica Urinali ex Vicinia morbosa aegrotante.* Recitata die XXIX. Aprilis 1786. Vid. Vol. II.

18.——*Sermo academicus, observationem de haematomate, alteram*

de interna hydrocelis causa exhibens, mense Junii 1786 recitatus. Vid. Vol. III.

19.——*Oratio de chyrurgo medicis auxiliis indigente.* Mense Maji 1787. Vid. Vol. IV.

20.——*De venaesectionis apud puerperas abusu.* die 21. Junii 1787 habita ibid.

21.——*De Rachitide acuta & adultorum, sermo academicus,* mense Maji 1787 recitatus ibid. Vid. Vol. V.

22.——*Orat. Acad. de Signis morborum ex corporis situ partiumque positione petendis.* Mense Maji 1788 Vid. Vol. VIII.

23.——*de Haemorrhagia Uteri ex spasmo secundinas incarcerante.* Mens. Maji 1789. Vid. Vol. VII.

24.——*Oratio Academ. de Virtutibus corporum naturalium medicis aequiore modo determinandis.* Mens. Maji 1789. Vid. Vol. VII.

25.——*Oratio acad. altera, de Virtutibus corporum naturalium medicis aequiore modo determinandis.* Mens. Decembris. 1789. Vid. Vol. VIII.

26.——*Sermo acad. quem ad Tyrones, cum Instituti clinici curam susciperet,* die 30 Maji 1785 praesatus est. Vid. ibid.

27.——*Sermo acad. de morbis pecudum, a medicis nequaquam praetervidendis.* Mense Maji 1790. Vid. Vol. IX.

28.——*Oratio academ. de Populorum miseria, morborum genitrice.* Mense Maji 1790. ibid.

29.——*Sermo acad. de circumscribendis morborum historiis.* Mense Maji 1791. Vol. X.

30.——*Orat. academ. de periodicarum adfectionum ordinandis familiis.* Mens. Maji 1791. ibid.

31.——*Orat. acad. de vertebralis columnae in morbis dignitate.* 1792. Vid. Vol. XI.

32.——*Sermo Acad. de medicis peregrinationibus.* Mens. Junii 1792. ibid.

33.——*Programma, puerperae de infanticidio suspectae defensionem exhibens.* Mense Maji 1793. Vid. Vol. XII.

34.——*Oratio acad. convalescentium conditione ac prosperitate tuenda.* Mens. Junii 1793. ibid.

In connection with these academic addresses that I gave in Pavia, I must note that formerly at this famous university when the academic

dignity was conferred, the professors used to make only a brief speech praising each candidate. Through my example I sought to transform this custom into a more useful one, in that I tried to choose scientific subjects for my public addresses. Soon I found the desired imitation, and my learned colleagues often made public addresses that I regret have not yet appeared in print. Most of my aforementioned memoirs that had appeared up to 1790 were collected in one volume and published at Leipzig under the title:

Joannis Petri Frank, &c. *Opuscula medici argumenti antehac seorsim edita, nunc collecta.* Lipsiae 1790. 8vo.

A number of these memoirs were also translated from Latin into German, and in part included in collections of selected memoirs for practising physicians and surgeons.

On January 14, 1786 I was appointed director of the hospital at Pavia, and received an annual increase of one hundred ducats from the Imperial Aerarium. On May 8 of the same year I became a member of the Royal Patriotic Society of Milan. At this very time a learned Italian priest, P. Ruttini of Pavia, translated into Italian the first volume of my Medical Police, to which I made various additions. It bore the title:

Sistema compiuto di Polizia medica, opera di Giovanni Pietro Frank &c. accresciuta di note dall' autore. Tomo I. In Milano 1786. Nell' Imperiale monistero di S. Ambrogio maggiore. 8vo.

Shortly thereafter I received His Majesty's command to draft a more progressive curriculum for the Medico-Chirurgical School at the University of Pavia. I tried to evade this task by pointing out that I was not yet sufficiently acquainted with the Italian constitution, that in general it is very difficult for a foreigner to achieve acceptance by the native people, that a foreigner as reformer rarely harvests more than reproaches and animosity, that all these conditions would tend only to vex and grieve me, and that finally as a result of all this my continued stay in Italy would become immeasurably more difficult. These objections were disregarded, and I was ordered to prepare the plan of studies. The draft was accepted, and His Imperial Majesty commanded me to put it into practice immediately. Until now all my papers had been written in French because I was not yet fluent enough in Italian. The Royal Governor in Milan ordered that the plan of studies be translated into Italian and then printed immediately. In connection with this last order I raised

an objection, and requested that before this happened my plan should be put into operation for at least four years and that I be given time to discover any mistakes that might be hidden in the plan. My petition was approved, and in the execution of the plan I soon saw that I had overlooked various difficulties. After four years had elapsed, my comments on the new plan were requested. These were put into effect without delay. Nevertheless, I requested that I be granted a further trial period of four years before the plan was sent to a printer. As I was ordered to Vienna in 1795, the aforementioned plan never appeared publicly. This is not the place to fill this gap, and so I shall mention only the following. According to the new arrangement, the number of academic lectures, of which there had previously been only eighty during the year, was now increased to a hundred and sixty. While the hot climate might excuse the four-month vacation period common throughout all Italy, it seemed to me irresponsible to waste the Thursday of each week, as well as eight to ten days at Shrovetide, fourteen days each at Christmas and Easter, eight days at Whitsuntide, and not many days less during Rogation week. After abolishing the excessive holidays, the students still had, aside from Sundays, enough time for rest, reading and thinking about the knowledge they had acquired. It was only just that the salaries of the professors were raised somewhat because they had more work. As my own salary was much higher than theirs, I voluntarily rejected any increase in my salary. In consequence 6,000 lira were divided among the other professors. It was not up to me to increase this sum. Doctor Presciani, a well-trained man, was appointed associate professor for the principles of anatomy and physiology, as well as for comparative anatomy and physiology. He was given the task of establishing a museum for these two sciences. The same professor had to prepare all the pathological specimens found in cadavers for a separate pathological museum and was required to maintain it constantly in good condition. The professor of surgery as well as the professor of pathology were required to take their students to the hospital twice weekly, and to demonstrate at the bedside the various diseases as they occurred in nature. The advanced students of surgery were required to attend with equal diligence the lectures for physicians as well as those for surgeons. The period of study for physicians was extended to five years, and for surgeons to four years. To provide better instruction in the apothecary's art, a special model pharmacy was set up.

For two complete years the students had to attend the clinics. During the first year they were simply observers; during the second they were themselves active. They took care of patients, wrote the history of the case, and, under my supervision, did everything that was necessary to effect a cure of the illness. An excellent chemist (Marabelli) was present at every ward visit and examined pathological fluids, as well as anything else that might have some bearing on animal chemistry.

Meanwhile the number of students, especially foreigners, who attended my lectures and clinic increased considerably and the reputation of the medical school grew so that I saw myself compelled to urge an enlargement of the school. Tissot had already had a fine room built for the reception of sick women. Now the same was done for the male sex, so that I now had at my disposal a total of twenty-two beds for patients of both sexes. Until now a surgical clinic had been attached to the university. My friend, the great anatomist and excellent surgeon, Professor Antonio Scarpa, often performed the most important operations in the surgical wards of the hospital; and Dr. Cera, a very experienced surgeon who was also attached to the hospital, in addition to performing other operations often operated for the stone with considerable success. However, these did not take place at any predetermined time, and so the students were unable to take advantage of them. Consequently, I also petitioned that several rooms be set aside and that a fine amphitheater be built for the surgical clinic and that, like the medical clinic, it be visited daily by the professors.

I also effected the building of a third ward for surgical patients, so as to be able better to separate them from the medical patients. In accordance with my proposal, Dr. Volpi, a promising young surgeon of Pavia, was put in charge of this ward. As the expenditures for medicaments in the hospital of Pavia had been much too high in relation to the number of patients and amounted to about 36,000 lira annually, my first task was to see that the physicians and surgeons of this institution were provided with a better pharmacopoeia. Every week I met with all the physicians and surgeons of the hospital, and also with the chemist Marabelli, in order to draw up a draft of this work. Because of differences of opinion, especially with the older surgeons, various things that I would have preferred to delete were left untouched. After its completion, this new pharmacopoeia was made the basis of all ordinary prescriptions.

After six months had elapsed and it was found that the physicians and surgeons of the hospital were entirely satisfied with it, this standard was approved and later printed under the title: *Apparatus Medicaminum ad usum Nosocomii Ticinensis.* Anno 1790. Ticini Reg. ex typographia Josephi Bolzani. 8vo.

The consequence of this work was that although the hospital physicians were now permitted to prescribe musk and other expensive remedies without special permission (which had previously not been the case), the annual expenditures of the hospital for medicaments decreased by more than half. Because of this saving which benefited the patients, I received a flattering letter of commendation from the authorities in Milan. On the death of one of the hospital doctors, I proposed the famous Professor Rezia for this position, just after the death of Dr. von Ramponi, professor of pathology at Pavia, I proposed the excellent Dr. Raggi for appointment to his post. A young physician, Dr. De'felici, one of my best students, was appointed to admit and to give first aid to patients received into the hospital. In this way the hospital at Pavia was gradually transformed into a teaching hospital; and now I proposed that, in addition to attending my clinic, the students should be required, under the guidance of experienced men, to visit all the wards.

Later, when Dr. Locatelli, a very good student of my two excellent friends and predecessors at Pavia, Bursieri and Tissot, had returned from England and Scotland whither he had gone to improve himself, I petitioned that a public clinic be established in the large hospital at Milan, and that Dr. Locatelli be put in charge. As a result my students, both native and foreign, who did not want to go home during our protracted vacation and then come back again to Pavia, were able to occupy themselves usefully for four months in collecting observations, just as during this same period they were able to take advantage of the surgical operations of the excellent Paletta and of the many pathological autopsies of the indefatigable and famous Monteggia.

On February 7, 1786, I was appointed Protophysicus and Director-General of the Medical Services for Austrian Lombardy and the Duchy of Mantua. In this capacity, in association with Paolo Sangiorgio, former chemical demonstrator at Milan, and Dr. Brusa, Secretary (*Cancelliere*) to the Medical Board, I undertook on September 21, 1786 the first general investigation of the apothecaries and medical officers in the entire land,

beginning with the provinces of Milan, Varese, Como, Lodi, and Pavia, and concluded it on October 22, 1786 with the intention of continuing it the following year. I was delighted with the beauties of these excellent regions, but much less so by the state of most rural pharmacies. The physicians and surgeons of these provinces, among whom I met several excellent men, chiefly students of Bursieri, expressed almost without exception a desire for a reform of the medical services in this land. In their comments on the existing defects they were much franker with me than I as a foreigner would have expected.

After my return to Pavia, I was given the task of drafting a plan for the organization of a directory for the administration of the medical services (until then it had been in Milan, it was now planned to be in Pavia, the center of education), and also a plan for the native pharmacies. These had to be based on existing regulations, so that in the

35. *Piano di Regolamento del Direttorio medico-chirurgico di Pavia.* Milano 1788. 4to., and in the

36. *Piano di Regolamento per la farmacia della Lombardia austriaca.* Milano, 1788. 4to.

there occur various things that were not proposed by me, but had already been introduced long before, and which I had been ordered to retain in the new plan.

On February 26, 1786, my daughter Carolina was born.

Late in 1787 I again took up the investigation of the medical offices and pharmacies that had been interrupted in the preceding year. Instead of the Milanese chemist, Sangiorgio, I was now accompanied by the excellent Scopoli, Professor of Chemistry and Botany at Pavia, and by Doctor Ripari, Secretary to the Directory for the Administration of Medical Services. I had to visit part of the province of Lodi, the entire province of Cremona, that of Casalmaggiore, and finally the Duchy of Mantua. In the first two provinces I found several apothecaries who had studied with Scopoli. For the most part the pharmacies of these men were in a much better state. As I had planned to stop at Mantua in the course of my return trip, we continued our investigations as far as Sermide close to the borders of the Papal State. Thence I went for a short while to Ferrara, saw the hospital as well as several other institutions, and became acquainted with Dr. Zechini, professor of the clinic there. I had hardly examined the pharmacies of Mantua after my return to that city when

I received an order to return to Milan immediately. Quarrels had arisen between the director of the chief hospital, the learned Pietro Moscati, and the hospital doctors, and His Imperial Majesty wanted to have the matter investigated. Since a concession for a period of nine years had been given to the municipal apothecary to conduct the pharmacy at this hospital, the expenditures for medicaments had risen so enormously that the bankruptcy of the hospital which had been so rich could easily be foreseen, despite the fact that the hospital physicians had themselves prepared the new pharmacopoeia for the hospital which had been confirmed by the authorities. I was occupied over six weeks with this important investigation. The result was that the administration of the pharmacy was returned to the hospital; and the concessionaire, who gave up his contract as well as the unbelievable profits, received the sum of 3,000 ducats.

In this same year I arranged for the convenience of my audience a reprint of

Guilielmi Cullen *Synopsis Nosologiae methodicae.* Edit. quarta. Ticini Reg. 1787. 8vo.

for which I prepared a foreword. As I still had some time before the beginning of the public lectures at Pavia, I took a trip with my older son to Turin, observed the establishment there, and became acquainted with the professors of this university, above all the famous Allioni, the truly learned clinical professor, Lanieri, the skilled professor of chemistry, Bonvicini, as well as the royal physician-in-ordinary von Somis. As I had been recommended to Count von Peronne, Minister for Foreign Affairs, he advised me to present myself to His Royal Majesty, all the more so as my presence in the capital was not unknown to His Majesty, and the Count offered to obtain an audience for me. The very next day I was accorded this honor in Caglieri, a nearby palace. The King graciously thanked me for the attention and care that I had devoted to the hospital at Pavia and to those of his subjects who were entitled to be received in this establishment. The graciousness of the prince encouraged me to tell His Majesty that many more of his subjects than of their Austrian neighbors were brought to this hospital mortally wounded by stabbing. Touched by this, the King told me that he was only too well acquainted with this atrocious business, and that in Piedmont alone there were annually six hundred such victims of assassination. "Severe laws," I said,

"would be able to cope with this evil." "You are wrong," replied the King. "Until now they have been of little use. The hot temper of the people and the example of many of those who are supposed to teach them gentleness render useless all my ordinances."

As I learned in private conversation with several professors, one of the directors of the University at Turin, who had been Minister for a long time, entertained the very greatest aversion to chemistry because he confused it with alchemy, despite the fact that several outstanding chemists of the capital, particularly Count von Morozzi whom I also visited, had done much for the prestige of this very useful science. This minister had instructed his professors to show me everything of interest in the school. Several days later we were all invited to dine with him. He asked me openly whether the gentlemen who were present had acted toward me in accordance with his instructions. To the dismay of the worthy gentlemen I answered this question in the negative. "How is that?" inquired the Minister. "These gentlemen," I replied, "did not feel it necessary to show me any of their establishments for chemistry which today are so indispensable in every country for public education." The Minister noticed whither I was aiming, and said with equanimity: "That is indeed not our most brilliant side."

The next day I was invited to witness the examination of a candidate for the medical doctorate. Perhaps it was the presence of a strange teacher that caused the candidate to become confused, and to my regret he failed.

I had also submitted to the authorities of Milan a plan for the practical instruction of young obstetricians and of midwives in a well-organized and equipped lying-in hospital, and this had already been approved by the highest officials at Court. Nevertheless, various circumstances prevented the implementation of this plan which likewise was never printed. As I felt the urgent necessity for improving midwifery in Lombardy, and was unable to overcome the existing obstacles, I finally took advantage of a dreadful occurrence.

An inexperienced rural midwife, in delivering a woman, had employed a wooden hook, and had killed both the mother and child. This instrument of death was sent to me, and I recognized it as the handle of a ladle. This ladle, still bloody, I sent to Milan, with the frank comment that after having made so many proposals to improve the condition

of midwifery, which was very necessary, I did not feel that I need reproach myself in any way for this dreadful occurrence.

At the end of 1788, the Republic of Genoa decided to organize a clinic in the splendid hospital of the capital city, and a plan to accomplish this was presented by Dr. Olivari. This plan was sent to me for my comments. Thereupon I drafted my own plan, using as a model the one at the medical school in Pavia. Later, in 1790, on the occasion of a journey to Vienna, I had this plan published.

37. *Plan d'école clinique, ou méthode d'enseigner la Pratique de la Médecine dans un hôpital académique,* par Jean Pierre Frank, Docteur en Médicine, Conseiller de Sa Majesté R. et A. au Gouvernement de Milan, Directeur de la faculté de Médecine, Professeur en Médecine Pratique dans l'Université Royale de Pavie. Vienne 1790, chez Chrétien Fréderic Wappler. 8vo.

This work was soon translated into Italian by Dr. Careno of Vienna, one of my former auditors, and printed at Cremona:

Piano di scuola clinica ossia metodo d'insegnare la pratica della medicina in un Ospedale academico, del Sig. Gio. Pietro Frank, etc. In Cremona, 1790. 8vo.

Similarly, my former student, Professor Titius of Wittenberg, translated this work, as well as two others, into German under the following title:

D. Johann Peter Frank's, k.k. wirklichen Gubernialraths zu Mayland, und Professors der praktischen Medizin zu Pavia, u.s.w. *drey zum Medizinalwesen gehörige Abhandlungen*: 1. *Entwurf zur Einrichtung einer klinischen Schule;* 2. *Entwurf zur Einrichtung eines medizinisch-chirurgischen Collegiums zu Pavia;* 3. *Apothekerordnung für die Oesterreichische Lombardie.* Aus dem Italiänischen. Leipzig bey Joh. Gottl. Feind 1790. 8vo.

On April 13, 1788 I was summoned to Count Fenaroli at Brescia. Here I became acquainted with Dr. Francesco Giuliani, a skilled physician and author of the book *De apoplexia nervosa.* It was particularly gratifying to me to make the personal acquaintance of Count Carlo Ruggieri, *Governatore dello spedale degli uomini.* This outstanding man is most active in everything that concerns his hospital, and treats the patients as a tender father would his children. There were then eighteen pious foundations (*luoghi pii*) in Brescia. The hospital for men had only

200 to 280 beds, but with the foundlings that were admitted it contained approximately 800 persons. All religions were admitted, and all the poor of the city received the necessary medicaments gratis. The hospital for women had 110 beds. Near this hospital live the orphaned girls *(orfanelle)*. There are also two other houses here for women who have been converted to a more moral mode of life *(per le donne convertite)*. Many come here only in the winter to obtain food, and in the spring they resume their old life. Almost all the boys in the orphanage presented a good appearance. Until they reach the age of seven, foundlings are raised by women. Then they are transferred to the boy's house. The girls receive a dowry of approximately 40 scudi. Both sexes learn to spin, sew, weave, or some other handicraft. Similarly, everything that is required by the men's hospital is made by the inmates. Furthermore, the *orfanelle* also learn to sing and as at Venice are instructed in music. There is also a foundation for persons who are incapable of work (imbecilli). I only hope that the fires of war have not destroyed all these monuments of philanthropy!

On May 15, 1788, I was entrusted with the supervision of all the hospitals (forty-three) in Austrian Lombardy and the Duchy of Mantua, and was given the rank of Counsellor to the Government of Milan. Instead of the previous annual salary of 100 ducats for directing the hospital at Pavia, I received an annual increase of 3,000 lire. In order not to remove me from my teaching post, it was left to my discretion to come to Milan and to attend the Council only as often as I considered it necessary. At this time I had printed in Germany:

Johann Peter Frank's, M.D.K.K. wirklichen Gubernialraths zu Mayland, Direktors der medizinischen Fakultät und sämmtlicher Spitäler der Oesterreichischen Lombardey, Professors der praktischen Arzeneyschule zu Pavia, u.s.w. *System einer vollständigen medizinischen Polizey*. IV. Band, Mannheim bey Schwan und Götz. 1788. 8vo.

Without even asking me, Doctor von Wasserberg of Vienna issued a new edition of the four volumes of this work, with his annotations, through the von Trattner Buchhandlung.

The same work was also translated into Dutch by Doctor Bake as follows:

Johann Peter Frank, M.D., Geheimraad en Lyfarts des Bischops van Spiers, hooglearaar in de Geneeskunde te Pavia &c, &c. *Geneeskundige Staatsregeling*. Naar den Derten Druk ait het hoogduitsch vertaald, en

met Aanmerkingen Vermearded, Door H. A. Bake. Medicinae Doctor. The Leyden. By Frans de Does. 1787-1793. 8vo.

At the end of June 1788, in the company of the famous physicist, Don Alessandro Volta,[21] and the Professor Abbate Bertola, well known for various of his works, my son Joseph and I undertook a journey to Venice by way of Cremona, Mantua, Verona, Vicenza, and Padua. The story of this trip and the others that I made for scientific reasons would then perhaps have deserved the attention of the public. But now, after fourteen years, especially such years as those through which we have had to live, everything has changed to such an extent that to mention what I saw would be both too late as well as too prolix for this work. Everywhere I turned my attention chiefly to public institutions for mankind and for medicine, as well as to the most famous people of each region from whom I felt I could learn something.

Hardly had I returned from Venice to Milan when I felt the consequences of this journey undertaken in unusually hot weather. I succumbed to an ailment from which my origin should have protected me constantly. At first it manifested itself in an inflammation of the right eye which was so severe that my friend in Milan, Dr. Paletta, the first hospital surgeon, feared I might lose it. Soon however, the illness changed into a severe podagra from which I suffered once or twice every year.

On April 2, 1789, at the time of the usual Easter vacation, my son Joseph and I went on a journey by way of Genoa, from there to the ocean, and thence to Nice in Provence to pay a visit to a sick lady who was under my care. I remained in Nice for eight days, saw all the sights of the city and the magnificent environs, and would have gone further into Provence to see cases of real leprosy which still prevailed at le Martigues had not the approaching end of the school vacation hastened my return.

In July 1789, I visited Marchese Botta of Pavia at one of his estates in the Genoese hills. While intense heat prevailed in Lombardy, I enjoyed the delightful coolness here (at Borgo Adorno). During the first days I climbed a high peak in the Appenines, the so-called Giraldo. From it could be seen a large part of Lombardy, Montserato, the Savoyard Alps, and towards noon, the Ligurian sea. I made a small collection of Alpine flowers. The inhabitants of these regions consume the stems and short

[21] Alessandro Volta (1745-1827), a native of Como, where he later became professor of physics. At the time of Frank's writing, Volta was professor at Pavia. He is best known for his contributions to electrical science, notably the Voltaic pile.

branches of *Carolina acaulis* raw, with oil and lemon juice, just as artichokes are eaten. I immediately found a small practice in this area which has so few doctors; among the rural inhabitants I saw various ailments, some serious, for which I prescribed. Most of them acquire their illnesses in Lombardy whither they stream because of the money that can be earned. They perform the heaviest work and then return affected by pulmonary disease or dropsy.

After ten days I returned from this trip and soon began to visit all the hospitals. After visiting that at Casalmaggiore, I set out with the *Intendante* of this province for Pomponesco to do the same there. For several centuries this large market town had had two small Roman statues which were exposed on the town wall to all kinds of weather. The Academy at Mantua wanted to have these rather beautiful statues in order to protect them. The government at Milan approved this, but when their representative came to fetch the statues, the people gathered under the leadership of Johann Joseph Cessa, the resident surgeon, and chased them away. Because of this disorder, the district commissioner wanted to punish the surgeon severely. Hardly had I arrived in Pomponesco when Cessa, a young man with a very expressive face, presented himself to me. Without even mentioning the earlier occurrence I asked him whether he had much to do, and whether he had difficult cases to treat. He answered: "Not at the moment, but not quite six weeks ago I performed a Caesarian operation on a 28-year-old primipara, Isabella, wife of Giuseppe Borella of Pomponesco." "You? A *Chirurgo minore*?" I asked. "What right had you to do this?" "The absence of the chief surgeon," he replied. "Was the woman actually dead?" "No she was not!" "And you undertook to perform this operation!" "Indeed, I did," he replied, and asked me to visit the woman. On the way he told me that because her pelvis was too narrow, as had been confirmed by the most skilled midwife of the town, this woman had not been able to give birth. He had convinced himself of the truth of these circumstances and had then undertaken the operation. The child had been born alive, but had died soon after birth. The mother, however, was well again, and had already gone to church during the past week. I requested the commissioner to accompany me, and we immediately went to see the woman. She was a young, lively woman, who willingly showed us the large scar on her abdomen, and said, pointing to Cessa, "I owe my life to this fine man!" I now took the commissioner's hand,

and requested him to forget the earlier error, to which he agreed. Furthermore, as I did not believe that this was enough, I gave the surgeon a moderate gift on behalf of the Medical Administration and recommended him to the authorities for promotion. Shortly thereafter this young man was promised a stipend if he wanted to go to Pavia for an advanced course of instruction in surgery. But as he could not leave his family and his practice, he had to decline this offer.

With respect to the first five years spent in Italy, I could be satisfied with the success of my efforts in this land. Bursieri and Tissot had already paved the way for me. On my arrival in Pavia I found that many of my native students, despite their outstanding talents, did not have the ardent desire for science nor the sustained diligence which I had noticed in most of my students at Göttingen. In the morning punctually from eight to nine I lectured in Latin on special therapy. Frequently, I found only half of my students present: most of them came a quarter hour, half an hour, or three-quarters of an hour late. I immediately made my position clear on this point, and requested my sleepy auditors not to appear at all, rather than to come too late and to interrupt my lecture to the disadvantage of the diligent students. As I repeated this frequently and emphatically, it helped to such an extent that most of my students, who were accustomed to breakfasting together at a coffee house before going to the lectures, often used to leave half the breakfast standing as soon as they saw my carriage from afar. It also came to my attention that my pupils knew little of the work and advances of physicians in foreign countries, and had greatly neglected the literature of their science. This was all the more reason for me to concern myself with this matter. From nine to ten, often till eleven in the morning, and from four to six, often till seven in the evening, I visited the clinics. As I demanded of those who agreed to treat patients under my supervision that they take a most precise history and keep a record of the case, many of my students soon resigned, especially at Shrovetide. As I had been accustomed to say much of benefit to them at the bedside, I stopped this practice immediately, wrote the case histories myself, and showed that I valued my teaching too much to want to squander it. After I had treated my patients silently for several days, my students gathered together and decided to choose two delegates whom they sent to me to promise in the name of the group that they would be diligent and attentive. Like a tender father of misguided children, I took

them back and after this occurrence redoubled my efforts to train them, which they now earnestly desired.

Until now the University library at Pavia had been open only on week days, and then only at certain hours, so that few of my students visited it. I brought about the correction of this error, and my efforts were so zealously supported by Abbot Genevrini, the director of this excellent collection of books which had been so inestimably enriched by the Emperor's purchase of many of Haller's books, that now none of the free hours passed without a stream of young doctors to this source of knowledge. Now I saw for myself what the many great men of this land had already demonstrated long ago, that the Italian, despite anything that had previously been said abroad, is as capable as any other of sustained effort, and, with his outstanding talent, if well trained in youth, is capable of overcoming all difficulties.

In my lectures I used my notes, which I now put in order. My students wanted an abstract of these, so I edited them in such a way that they would be of more use to the students than to strangers. The unbelievable number of other tasks on which I was engaged often compelled me to be brief, with the result that my work often suffered from a lack of clarity. Due to the lack of means, many of my students were unable to purchase any other books. As a result, I often saw myself compelled to include entire case histories in this compendium, where they did not really belong. I mentioned no authors by name, nor did I give citations, even though the particular sections may have been used, because I used to fill this gap while explaining my text. Such was the work out of which five books gradually grew, namely:

39. *De curandis hominum morbis epitome, Praelectionibus academicis dicata,* Auctore Joanne Petro Frank, etc, Ticini Reg. et Mannheimii 1792 apud Balthasarum Comini 8vo. *Liber I. de febribus.*

40.—*Liber II. de inflammationibus.* Ibid. 1792

41.—*Liber III. de exanthematibus.* Ibid. 1792

42.—*Liber IV. de impetiginibus.* Ibid. 1793

43.—*Liber V. Pars I. de Profluviis.* Ibid. 1794

In Venice, the liberty was taken to reprint this work, and fortunately most, though not all, of the typographical errors that had occurred in the Pavian edition were corrected. Dr. Mohrbeck, one of my students, who had lived in my house for about two years, translated the first volume

of this work into German. He claimed to have done it under my supervision, but as I had little time to give him because of my affairs, it was not very fortunate. [It appeared under the title:]

Johann Peter Frank &c. *Uber die Behandlung der Krankheiten des Menschen.* I. Theil. Mannheim bey Schwann und Goetz. 1794. 8.

Later he translated the next two parts. I do not know who continued the work after the death of this translator.

During the years that had passed, I was called three times to the court of Parma, more often to Piacenza, to attend patients, and in this way I had an opportunity to observe closely the hospitals and health establishments there.

In 1790 the University of Pavia was cast into the deepest mourning by the death of Emperor Joseph II, who had always cherished such benevolent feelings toward it. I felt this loss deeply, and I could not have felt otherwise out of gratitude for the care and protection with which he had so fully favored suffering humanity, the sciences, and myself. In July, together with my oldest son, I travelled to Vienna by way of Innsbruck and Salzburg. At Salzburg, I had the honor of being presented to the Prince-Bishop by my meritorious friend, Court Counsellor Hartenkeil. I had hardly been in Vienna fourteen days when on August 28th, I received an order from the new ruler to examine the organization of the General Hospital of the city, and to submit to His Royal Majesty my opinion as to changes that I would regard as necessary and useful. For three full weeks I visited this vast hospital, presented the report that had been requested of me, and returned quietly to Italy. In the meantime, the arrows of envy were already aimed at me; nevertheless these were not to be dispatched so soon.

On February 4, 1791, I was elected a member of the Helvetian Society of Physicians and Surgeons.

It was not long before the newly elected Emperor, His Majesty Leopold II, came to the Italian States. Upon being presented to the monarch, he asked me about the state of all the hospitals in this region. I replied that I was no longer adequately informed, as the Milanese nobility had taken over the direction of all the hospitals, indeed at His Majesty's command, and that I had been deprived of all the influence on these institutions which I had previously had. "It was not meant in this way," said the monarch. "You are still charged with the medical supervision, and you are

to continue it, as under the previous government!" The following day the Emperor visited the University where he was received ceremoniously by all the professors and observed all the objects used for public instruction. When the Rector said that nothing more remained to be shown, His Majesty inquired why there was no demonstration of the pathological cabinets that I had caused to be organized. I informed him that this museum because of its newness was not yet entirely worthy to be observed by His Majesty. Nevertheless, it was opened, and the Emperor spent a good half hour looking at this collection. "How long have you been collecting?" he said. "Two years," I replied. "Now you have done everything possible, and I regard this work as an important part of your services to suffering humanity. There remains but one thing that I desire." I ventured to guess the royal wish, and said that this was also already realized in part as I had had faithful drawings made of the most important specimens, and in time intended to present them to the public. The Emperor received my reply graciously, went on to the nearby clinic and informed himself regarding all the ailments admitted there. As His Majesty then proceeded to the adjoining hospital, surrounded by its directors, and as I wanted to avoid any appearance of mixing in the affairs of others, I remained in the clinic. Thereupon, I was summoned and His Majesty was pleased to ask me when I had last seen this hospital. I said that this fate had befallen it on June 12, 1785. "Now," said the monarch out loud, "I hardly recognize this hospital any more since you have improved it so much. Again I repeat that you will continue to direct all the hospitals in this land!" Thereupon, all the arrows that had been aimed at me were replaced in the quivers until a better opportunity should offer itself.

Several days later I had the good fortune also to be presented to His Imperial Majesty in Milan. On this occasion I again received the comforting assurance that the organization of medical services that had been carried out in Lombardy under my influence was viewed with the highest approval; and I was commanded to continue energetically with this work which is so important for mankind. Furthermore, should I be confronted with insuperable obstacles, I was to inform His Majesty immediately in writing.

In July, 1791, again accompanied by my oldest son, I made a trip to Switzerland. On this journey, I made it my aim to observe closely the

inhabitants in the regions through which I would travel so as to determine whether or not they were subject to the physical influences in those parts, and to visit all those physicians who could give me the desired information on this subject. I had reason to be satisfied with my harvest, but cannot render an account of it here. I wish simply to recall that this journey provided for me the pleasure of making the personal acquaintance of my great predecessor at Pavia, the famous Tissot of Lausanne, and of enjoying his instructive company for three whole days. In Geneva, I made the acquaintance of those splendid scientists, Odier, Pictet, Senebier,[22] and Cabanis. I had to do without the company of the unforgettable Bonnet,[23] because he was at death's door. Near Zürich, I had already previously become acquainted with an extremely interesting physician named Dr. Hotze. Tissot himself told me that he considered him to be the leading physician of his native land. My friend Rahn in Zürich told me the same, and this was also the opinion of most of the Swiss doctors whom I heard speak of Hotze. May the countries be many where the physicians do justice to each other! With a great deal of pleasure I also saw the meritorious Dr. Hirzel[24] in Zürich. The famous master himself overwhelmed both Rahn and myself with compliments. Lavater also received us in a most friendly spirit. Professors Usteri and Schinz in Zürich, as well as Dr. Rengger in Bern, my former students, did everything in their power to make my stay in their country a pleasant one. I shall pass over the remainder of this journey which was so important for me, and shall continue the story of my residence in Italy.

As various irregularities extremely prejudicial to the health of the inmates had crept into the penitentiary at Pizzighettone, I received the command on December 13, 1791, to proceed there without any loss of time, and to investigate most carefully everything that related to the medical police of the place. I found that the complaints of the three hundred miserable persons collected there were only too well-founded, described their situation emphatically, and expressed my opinions on the way in which the abuses that had developed might be removed without inter-

[22] J. Senebier (1742-1809), plant physiologist, who in 1800 published his *Physiologie Végétale,* in which he dealt with the influence of light on the nutrition of plants.

[23] Charles Bonnet (1720-1793), a lawyer by profession who turned to the study of natural history as a hobby. He is best known as an exponent of the preformation theory.

[24] Johann Kasper Hirzel (1725-1803), chief municipal physician in Zürich, and philosopher, known through Klopstock's poem *Der Züricher See.*

fering with the purpose of the jail. The court approved my proposals, and the fate of these unfortunates was improved in many ways.

Hardly six months had passed since the departure of the Emperor from Italy when, disgusted with the many intrigues that I saw being spun and convinced that I could be of very little use in this situation, I requested His Majesty's permission to lay down my duties as Director-General of Medical Services, and for the future to continue only with my professorship. On the very same day that His Imperial Majesty received my petition he was pleased to order his government at Milan to investigate the reasons underlying my request, and to report to him. Before this could happen, however, this father of his people also lost his life. Hardly had this sad news reached Italy, when three of my colleagues brought accusations of dreadful crimes against me before the throne of the new ruler. His sense of justice demanded that the Milanese government investigate most carefully the veracity or untruth of these serious accusations. While this investigation was going on, a veritable shower of lampoons descended upon me. In part, the authors and instigators of these libels did not remain unknown. In public newspapers, even in German ones, I was denounced as a political criminal who had already been cast into chains in Italy. In the face of all this, I kept my peace, relying on my knowledge of my innocence and on the justice of my Highest Judge.

A year passed, and still no judgment was handed down! Late in 1792 I was requested to visit a Swedish lady who because of her poor health had moved to Pisa. The vacation period permitted me to undertake this journey immediately in the company of my oldest son. We travelled by way of Piacenza, Parma, Modena, Pistoja, and Lucca. After seeing the most important things in these places, I continued my journey to Pisa. The sick lady was under the care of the well-known Dr. Vacca, clinical professor at this University. After we had completed our consultation, I visited the sights of Pisa. I found the hospital of this city very clean. I was interested in meeting the medical professors of this university, and I paid visits to as many as were present during the academic holidays, namely Messrs. Petri, Castellazzi, and Branchi. I also met Slopp, Professor of Astronomy, whose nephew was my student at Pavia, and in his company inspected the observatory of Pisa which was well equipped with instruments. Count von Czernichew, the President of the Russian Admiralty, was likewise present in this city. As the famous Weikard had asked me to look after his

health, I also paid a visit to this patient. On October 24th we journeyed to Livorno where we saw all the sights; then I returned by way of Pisa and Florence, where I had the good fortune to be presented to His Royal Highness the Grand Duke of Tuscany. After we had observed the rarities of this spendid city, I made the acquaintance of several of its famous men, particularly Felice Fontana,[25] Bicchieraj, and Nannoni. At my request, the latter took us on a very detailed tour of the splendid Hospital di Santa Maria Nuova, where he was chief surgeon. I was extremely well satisfied with all the arrangements, especially those for the mentally deranged patients.

I returned to Pavia, but without being able to learn anything about the outcome of my case. Soon my health was seriously affected, but in the midst of the most terrible defamations one of the most excellent princes of Germany, the reigning Margrave of Baden, deigned to appoint me, as a native of his land, to the post of his first physician-in-ordinary. But as long as any question remained concerning my integrity, it was impossible for me to decide to leave Italy. Hardly had I partially recuperated, when I departed for the capital to advance the outcome of my case. Here I was presented to His Imperial Majesty, who was pleased to inform me most graciously that my innocence had been juridically proven, and that the verdict had already been sent off to Italy. I was solemnly proclaimed to be innocent, confirmed in all my offices, and my accusers were punished. No matter how much I wanted to return to my fatherland, I could not find it possible to abandon service where I had been treated so nobly and justly.

When I returned to Milan, I learned that my good students, to show their loyalty, had decided to ride out to meet me and to accompany me ceremoniously into Pavia. I asked them to avoid completely anything that might revive the old enmities. From this time on, I again enjoyed in Italy the quiet which was so necessary for my important affairs.

Finally, on January 15, 1795, I received the Imperial Command to repair immediately to Vienna and there to participate as a member of the Military-Medical Commission appointed by His Imperial and Royal Majesty to improve the medical services of his armies. On January 26th I arrived in the capital. While I was occupied with these matters, the clinical school at Pavia, by order of the Milanese government, was placed

[25] Felice Fontana (1720-1805), distinguished Italian naturalist and physiologist, who founded the Florentine Museum of Natural History. He was the first to describe the kidney tubules, and the space at the angle of the iris is named after him.

in the charge of my eldest son, who during the preceding year had been appointed my assistant. In this same year, my younger son received his degree as doctor of medicine.

After completion of the business of the Commission, His Imperial Majesty was pleased, on November 20, 1795, to relieve me of the duties that I had performed in Italy for ten years, to appoint me Imperial and Royal Court Counsellor, Director of the General Hospital, and full Professor of the Practice of Medicine at the University of Vienna, and to grant me an annual salary of 5,000 gulden exempt of all deductions, as well as a very appropriate free residence and the payment of all my expenses for travelling. At the same time, my son, Doctor Joseph Frank, was appointed Chief Physician to the General Hospital. But as the schools at Pavia were soon to reopen, His Majesty ordered that Doctor Frank, the Chief Physician, who in the meantime had come to Vienna, should return to Pavia as associate professor and take charge of the clinics as well as of the chair of medicine until my successor would be appointed.

On December 14, 1795, I began my lectures on the practice of medicine at the University of Vienna. I held them in Latin, using my *Epitome de curandis hominum morbis.* A few days later I also opened the clinical section of the General Hospital. I was in no way obligated to the hospital by virtue of my position; nevertheless, I felt it necessary to explain as clearly as possible to my students the principles on which I acted at the bedside; and until now I have always continued to devote to them gratis one hour every day for this purpose. Compared to Pavia, the number of my students was not large, despite the fact that at first a considerable number had come out of curiosity. My younger son, Doctor Franz Frank, was appointed my assistant. At that time, the medical clinic as well as the adjoining surgical clinic consisted of two small rooms, with windows only on one side, and connected by a rather dark passageway that was generally filled with smoke in the winter. In each of these rooms six beds were set up—on the one side for men, on the other for women. In the middle was a separate small room with one bed where surgical operations were performed. These rooms could just about accommodate three beds to be visited by twenty-five to thirty young physicians, but in 1785, in Stoll's time, when I found a gathering of some seventy-five students, the room was much too small, and air of necessity rapidly assumed a quality which was inimical for the students as well as for the patients.

I had been appointed for only two to three months when a considerable number of young foreign physicians arrived in Vienna to take advantage of this institution. This circumstance, as well as the fact that a large number of surgeons also attended because they were required to attend the medical school for a time before taking their examination, soon produced a state of affairs where all relation vanished between the space available in the clinic and the number of its students. Soon many of these fell seriously ill with contagious fevers, which had already happened frequently under Stoll. Consequently, I presented the matter immediately to the competent authorities. Before any change could be made, however, my own son, Doctor Franz Frank, unfortunately became a victim on March 19, 1796 of his own zeal and the dangers prevailing there. Here, too, I spare the reader any mention of my terrible feelings at such a loss. Now Doctor Cappellini of Pistoja, who had attended my school in Pavia, and had distinguished himself there as a very skilled young man, was appointed as my assistant physician. Until the medical clinic was enlarged, I received permission to transfer the school of surgical practice elsewhere. To accomplish this aim, I assigned to it two large wards in the General Hospital, each capable of holding twenty patients of either sex. With the approval of the government, the large room between them was transformed into a surgical amphitheater, in which all the important surgical operations that had previously been performed in the wards, to the horror and fright of the patients present, would now be carried out by the chief resident surgeons of the General Hospital as well as by the professor of the surgical clinic in the presence of all his and my students. The former rooms of the surgical clinics were now occupied by medical cases for the use of my students. By placing only five beds in each of my four rooms, I gained somewhat more room, and was able to visit twenty patients daily with my students. Meanwhile, since many of the students, whose number now increased very greatly from month to month because of the influx of foreigners from all nations, were still affected too frequently by contagious diseases, the four small rooms of the clinic together with the connecting passageway were finally, at His Majesty's command, converted into two fine, rather high wards for patients, provided on three sides with windows as well as with ventilators. Each of these wards had twelve beds; one was for male patients, the other for female patients. In this way the danger of infection was greatly decreased.

As various incurable diseases, conditions that are rare in general practice and cases that are obscure even to the practised eye of experienced physicians, occur in a large hospital such as that in Vienna, it seemed to me that this was pre-eminently the place to investigate the causes and effects of these diseases on their unhappy victims, and thus to extend the limits of medical knowledge by means of pathological autopsies. Indeed, since the opening of this hospital many cadavers had been carefully autopsied due to the private initiative of its physicians and surgeons; but frequently they lacked time, an adequate place for such examination, and the necessary accessories. Furthermore, the preparation of many such pathological specimens, so that they can be demonstrated to the greatest advantage, requires a certain practice and skill which are not possessed by every anatomist, no matter how well acquainted he may otherwise be with the healthy structure of the human body. But granted even that all these obstacles were overcome, still only the least of such important specimens reach the right hands. Most of them remained in the hands of individual physicians and surgeons, and the public instruction was deprived of this extremely important aid. Due to the indefatigable diligence of the excellent directors a number of very important pathological specimens had been collected in the anatomical museums of the University, but it was little indeed when compared with the material that was buried with the cadavers from the General Hospital without any detailed examination. In addition, the specimens that were available were prepared more from a physiological point of view and were too far from the spot where they might have been employed most conveniently by the medical teacher in his daily lectures. Here in the hospital I found hardly four or five pathological specimens, which in addition were poorly preserved. Indeed, how should more specimens have been obtained even by zealous physicians and surgeons without apparent danger to life in the dreadful morgue where an unbearable stench prevailed? My primary effort, therefore, to achieve this ultimate purpose, as well as to save patients in a trance who appeared dead, was to obtain a roomy and at the same time clean morgue, next to which would be a small but usable kitchen for warming up the necessary water, etc., and then a separate room which would be set aside specifically for pathological autopsies, as well as an adjoining room for the Prosector. This useful proposal was approved without qualification. In view of the number of cadavers in such a large hospital to which so

many patients were brought in the last moments of their lives, a separate pathological Prosector was required, and Rudolph Aloys Vetter[26] was appointed. For the classification and preservation of the pathological specimens, a spacious room adjoining the lecture hall of the school as well as the necessary closets and vessels were set aside, and at the same time it was ordered that a precise list be kept of the collection. As far as possible, each specimen would be accompanied by a short history of the disease that had ended fatally. The other hospitals of Lower Austria received instructions to carry out similar projects and to send the specimens to the newly established pathological museum in Vienna. Although this last aim has as yet not been achieved, for hardly two specimens of this kind have been received, nevertheless simply from the cadavers of the hospital, and through the contributions of my non-resident friends interested in science, many and in part very important specimens were prepared during the first two years of this institution's existence. If our zeal does not cool off, this museum may within ten years become the leading one of its kind in Europe.

As I had always been of the opinion that the establishment of any larger hospital should always be guided by three points of view, first, to provide care for the sick poor, secondly, to train skilled physicians and surgeons, and thirdly, to advance medical science, there still remained various things to propose so as to achieve these important ultimate goals.[27]

For the first of these I had already made excellent arrangements; nevertheless it seemed to me that the work could still be improved little by little. The pharmacopoeia of the General Hospital, which had formerly been very good and was available only in manuscript, was no longer adapted to the continually advancing times, and it seemed to me that the annual expenses for medicaments which amounted on the average to 45,000 florins could be reduced without in any way harming the patients, perhaps even to their advantage. Consequently, the government agreed that the new military pharmacopoeia, which had been prepared only a few years earlier by the Military-Medical Commission, and which our hospital physicians and surgeons had declared to be adequate except for a few

[26] Rudolph Aloys Vetter (born in 1765 at Carlsberg in Carinthia) is known for his *Handbuch der Anatomie, Lehrbuch der Physiologie,* and his *Aphorismen zur pathologischen Anatomie* in which he first described the round perforating gastric ulcer. Vetter died before reaching the age of 40.

[27] For the general background of Frank's work at Vienna, see Arturo Castiglioni's "The Medical School of Vienna," *Ciba Symposia,* 1947, 9, 634-664.

items concerned in the treatment of children and midwifery patients, would be taken as a basis for ordinary medical prescriptions. As a result of this regulation, there was an annual saving of 7,000 to 8,000 gulden, even after deduction of the charges caused by the so-called early prescribing *(Frühordinazion)* for non-resident patients in the hospital, a former practice carrying with it an annual expenditure of 4,000 to 5,000 florins. On the other hand, it appeared to me that the diet of the patients urgently needed to be increased with regard to the kinds of food, as well as with respect to the liberality of the physicians in prescribing this or that increased food portion for convalescent patients. The majority of our patients are artisans, day laborers, etc., who need their strength in order to be able again to feed their starving families. While recommending to the hospital physicians and surgeons to exercise all reasonable economy in view of the not entirely adequate income of the hospital, yet I also urged upon them not to economize with anything that might contribute to the more rapid recovery of the convalescent patients, for this would redound to the advantage of the hospital itself. At that time, the food for the patients was provided by concessionaires, or *traiteurs,* who also provided board for a number of assistant physicians and surgeons. As this latter circumstance could easily give rise to reciprocal obligations, these physicians and surgeons were requested to eat elsewhere. As a fixed price was now to be paid to the concessionaires for the daily feeding of both the free patients and the paying patients, they complained bitterly about these regulations, and declared that they would no longer be able to provide at this price a diet such as was now prescribed by the physicians and surgeons. A small increase was not able to satisfy them, and as I in turn was dissatisfied with their service, the present administration was introduced with the approval of the government. From the culinary point of view it was a considerable improvement, although in times such as these when everything is dear it is of course more expensive. Until now the bread portions had been distributed on the basis of a price fixed in 1784. With rising prices, these had become smaller and smaller, until finally they were completely inadequate. Now the portions were determined on the basis of weight, which is a much more constant standard, and were increased to conform with the practice of other large hospitals in Germany and Italy. It also seemed to me that for the free patients, and for those who were admitted for a fee of 10 Kronen, the hospital schedule did not leave sufficient time between

the administration of the prescribed medicaments and the serving of meals. The physicians did not make their rounds until eight o'clock in the morning, so that the medicines they prescribed could not be furnished by the hospital pharmacy earlier than about ten or eleven o'clock. At this time however the patients were supposed to be fed, so that only very few medicines could be given to the patients until around noon, except for those that had been prescribed the previous evening, but which not infrequently had to be omitted the following day. At night internal medicaments were only rarely administered. In view of this situation, I fixed the time for the morning visit of the physicians and surgeons to their patients at seven o'clock throughout the entire year, and the mid-day meal at eleven in the morning. As the evening meal was still served at five o'clock, the intervening time was shortened by one hour. But since the evening meal was smaller, the interruption in the administration of the medicaments was brief. In serious illnesses, medicines now had to be given throughout the night.

Previously there had also been separate rooms set aside for the convalescent patients of each sex. However, the convalescent was not always attended by the same physician who had treated him during his illness, so that the new doctor was unaware of much that he should have known in order to treat the patient properly, and the convalescent found it difficult to place his trust in a physician whom he did not know, and to relate the history of his illness faithfully. For this reason a separate room close to each medical ward was now set aside for convalescents, and until they were able to leave the hospital cured, these patients were attended by their former physician.

Until now the treatment of all internal diseases had been left to the four chief physicians of the hospital, so that each of them, especially in the fall and winter, often had 150 to 180, and even more patients to treat. I was not unaware that there were hospitals in which one physician had to care for 300 to 400 patients, but I knew from my own experience, gained over a long period of time, just what a man is able to accomplish in such important matters. I was aware that with an excessively large number of patients to treat, the doctor's memory might not always remain so true, and that this might result in harm to some patients. I felt that the doctor had to spend at least three minutes at the bedside of each patient, and that even with only 150 patients, he would have to remain longer than

three and a half hours, until the time for feeding the patients had elapsed, so that the last morning patient would not be seen for a long time. Finally, I had been convinced by experience that in a period of twelve years at the General Hospital, more physicians and surgeons had become victims of contagious hospital fever than were attacked in any other five hospitals of equal size over a similar period of time; and that consequently excessively long rounds in such a place could easily be harmful to the patient and very dangerous to the physician. On the basis of these facts I formed the opinion that a fifth chief physician was not only not superfluous, but instead very necessary for the General Hospital. With the cessation of the practice of early morning prescribing in the General Hospital, a charity doctor was appointed for the city, as had already been done in the suburbs, and one of the chief physicians of the General Hospital was chosen to fill this post. At my suggestion Dr. Sallaba, a learned practising physician well known as a writer, was appointed to fill his place. As I had once done in Pavia, I wanted also to have in this hospital physicians who, in addition to the necessary experience, were thoroughly versed in the entire theory of medicine and were abreast of the most recent contemporary discoveries, so that the medical students would receive the best possible instruction not only in the school of medical practice but also in every department of the hospital, and would have an opportunity to observe the therapeutic methods not only of the clinical professor but also of others and so be able to compare them. Dr. Sallaba, who suffered from an incurable pulmonary disease, died of a hospital fever several months after his appointment, and his post was given to Dr. Rensi who had served as assistant physician since the establishment of the General Hospital. The appointment of a fifth chief physician increased the hospital expenditures; but later when the eldest chief surgeon, Sartori, died, it was felt that four chief surgeons would be able to attend satisfactorily to the "externists" (patients with external maladies), and so, except for a few hundred gulden, this increase in expenditures was reduced.

The stables underneath the female wards were divided into a number of single rooms, which were lacking in our hospital, for epileptics, or for other patients who were disturbed, or who aroused aversion.

Most of the lunatics in the Mad Tower could never be let out of this unhealthy building owing to the lack of a proper place. On Sundays and holidays, a crowd of idle, meddling persons collected around the

Tower, disturbing and exciting inmates by shouting at them, and sometimes even slipping them sharp instruments and other dangerous tools. At my suggestion, access was now blocked by a wall, and on each side of the Mad Tower a lawn was planted with trees and turned over to the unfortunate lunatics where they might enjoy themselves and move around in the fresh air. The toilets, which were present in the cell of each lunatic and which gave off an unbearable stench, were bricked up. Instead, each one received a covered vessel which could be removed each time immediately after having been used.

The surgical bandages and instruments were also improved or supplemented, and as a requisite supply of the latter was not available any longer, care was also taken to supply this.

With regard to the training of skilled physicians and surgeons, the foundation was laid by the expansion of both clinical establishments, by the various remarkable cases, through the surgical amphitheater, the pathological museum, as well as through the entire system of lectures that embraced all medical practice, and which all the assistant physicians, surgeons and internes attended diligently to the extent that their hospital duties permitted. As the distance of the hospital from the public libraries, and the impossibility of acquiring the necessary books themselves still prevented various students from increasing their knowledge daily, a small medico-chirurgical reference library was started, which was intended for the use of the hospital physicians and surgeons as soon as some degree of order could be brought into it and the requisite conveniences could be provided.

Pathological autopsies, and the preservation and description of the specimens found in these examinations, are very important aids for the advancement and extension of medical knowledge. The most important observations that the chief physicians and surgeons make, and the prevalent diseases that they find on their wards, are reported every time at the regular sessions of the so-called House Commission. If one of the physicians wants to use a newly discovered medicament that has already been tried successfully elsewhere, but is not yet contained in the military pharmacopoeia, the hospital administration gives him an opportunity to do so.

In 1797, I became a member of the commission appointed by His Majesty to revise the curricula, and I drafted the medico-chirurgical study

plan which was then transmitted by the commission to the monarch for his approval. In the same year, I wrote a foreword for a book by my son Dr. Joseph Frank entitled *Ratio Instituti clinici Ticinensis* (Viennae, 1797, 8vo.) In it I developed in detail my ideas on the Brownian doctrine.[28]

On June 22, 1798 I became a member of the Royal Spanish Medical Society of Madrid, and in November 1800 of the Medico-Chirurgical Society of Venice. In July of the latter year I had a severe, although short, attack of gout, after which I suffered from a marked weakness, and both legs developed a marked hydropic swelling. I realized that I would have to give up all work for a time and take a country vacation. Hence I proceeded to Upper Austria to the Gmundnersee, then I visited the Kammergut, and in the eleven days spent in these romantic regions I recovered completely.

Finally, on July 16, 1801, I was appointed a member of the committee for the establishment and organization of veterinary medicine and of a veterinary hospital. In the plan that I had drafted at the University of Pavia, I had requested either that such a school be established, or that the school which already existed at Mantua be merged with this academic center and expanded. At that time I called attention to the advantages of a close linkage of both sciences in one place, and showed that if medicine had not been so limited and restricted to only one species, even though the noblest among living creatures, it would long since have achieved a greater degree of perfection. Had not the science of the healthy human body and its functions benefited greatly, I said, since we had begun to study the physical structure of various animal species, to dissect carefully the organs with which they perform their functions, and to compare one with another? Had not even a closer acquaintance with the life of plants thrown a considerable light on that of man and his animal relatives? Why, then, do we work piecemeal and always neglect the whole for the parts? We should teach first of all, I continued, a general anatomy and physiology of animate nature for all kinds of people who want to devote themselves to the sciences, which after all are related one to another, before we develop these important branches of human medicine in such detail and explain to future doctors their application to one species of

[28] The Brunonian (or Brownian) system was founded by the Scottish physician John Brown (1735-1788). It affirmed that a state of health depends on the normal excitability of the organs, and the proper dosage of stimuli. Disease is a disproportion between stimulus and excitability.

creatures. Establish anatomical museums where organs that in different animals perform a similar function will be arranged next to each other, while organs found in only one animal species for a special function are placed separately. To each of these groups the plants will make their contribution. Right next to these anatomico-physiological museums, set up in a pathological museum organs of these same animals that have undergone morbid changes, or that have been newly produced, so as to make possible a study of comparative pathology. In addition to the clinical, medical and surgical school, our university should have stalls for sick horses, cattle, and sheep. These stalls should be attended by separate teachers of veterinary medicine; but they should also be visited by the professor of clinical medicine and his students to study the various causes that produce and the symptoms that accompany the same disease in man and in domestic animals, as well as the differences in the dosage and modes of action of medicaments in man and in the aforementioned animals. The veterinarian should also be experienced in human medicine, and both he and the physician should seek constantly through comparative therapy to extend the frontiers of both sciences. The plan that I proposed met with approval, and Emperor Joseph II ordered that it be carried out; but suddenly the matter took another turn and the school of veterinary medicine was moved to Milan.

Before the academic year 1801 had ended I received a command to inoculate a number of orphans and foundlings in the General Hospital with so-called cowpox or vaccinia and, after some time had elapsed, to inoculate the same children with the true pox, and to report on this experiment. At the beginning of September, I carried out this important assignment by inoculating twenty-six children of whom, however, only fifteen actually developed cowpox. I took advantage of the interval during which we had to wait to go on a vacation that I needed. Again I visited the regions where in the previous year I had regained my lost health. From there I made a short trip to Salzburg. In November of the same year I took the fifteen children that had been successfully inoculated with cowpox, and inoculated them with smallpox matter. Here I wish to recall simply that the result was completely in favor of cowpox.

So much about my life. Up to this moment it has been a very restless one, and if I may say so, more devoted to my fellowmen than to myself. Sometimes I feel out of sorts, and I say to myself: "Had I but

chosen my father's occupation, I would have slept more peacefully!" "Slept?" answers my reason later, "who is born only to sleep?" Then I remain silent and red with shame, and courageously lift the accustomed burden to my aging shoulders. I can accuse neither Germany nor Italy of ingratitude. The languishing little plant, which I, as the author of the work on Medical Police, had implanted in that soil, has grown within a short period of time into a tree whose branches have already spread over the greater part of Europe and which everywhere has borne fruit of a maturity that I myself had not expected. Let my tomb be in the shade of such a tree! Will envy ever dare to disturb my ashes there? I came as a German to Italy, to that fount from which previously all Europe eagerly gathered the most important medical knowledge, to return to it a science improved in many ways. If I have accomplished this great purpose, if most of the two thousand physicians whom I trained there speak favorably of the instruction which they received, then I have justified the esteem in which foreigners hold the culture of my fatherland, and Italy, that land of genius, has set up an honorable monument for me in the uninterrupted confidence placed in me for ten years. In all my work I owe a great debt to those who honored me with their approval. To complete my *System der medizinischen Polizey* two more volumes will be required, and I shall have to supply at least three more volumes of my *Epitome de curandis hominum morbis*. Of the observations, in part very important ones, that I made in the clinics of the three universities, I have not published even a thousandth part. At great expense I had prepared a number of fine engravings of important pathological specimens; and all this lies buried in my desk! But if one looks back over all the professional matters with which I had to occupy myself in my various positions, if one considers that I permitted myself practically no recreation, then I may perhaps hope for indulgence. The materials for that which I still have to publish are all ready, and I think that after so many years of experience both medical police and medical practice will probably have gained more by my reserve than they have lost through my silence.

Vienna, 24 December 1801.

A Short Abstract of a Long Life

ROBERT MEYER*

1924-1929

DURING these years, which meant reconstruction of my economic situation, I demonstrated in the Gynecological Society in Berlin, with the help of X-ray photos, the dependence of the formation of the cotyledons in the placenta from single larger arteries. I also demonstrated three cases of angiomata of the ovary or angioma-like residues of the corpus luteum, while a corpus albicans was missing. Similar formations were not found without preceding pregnancies. At the same time I demonstrated in a child of six days mucometra and a transverse septum at the os internum, which was covered on both sides by mucus-producing epithelium. Twice we found in the puerperal uterus septa similar to those described in the uterus of the whale and the sheep. Finally I demonstrated two malformations, the first a cystovagina duplex with uterus bilocularis and atresia of both ureters and rudimentary bladder. The vagina was so large that the fundus was anterior and the uterus appeared to be lying in the abdomen. In the second case there was a complicated malformation in the rudimentary pelvis. Finally, a diffuse adenoma pulmonis was shown combined with hydrops universalis of an eight-month fetus. The fetus was otherwise normal. The mother was also normal. This is a rare but important malformation of the lung *(Zeitschr. f. Geb. u. Gyn.,* 87 [1924]).

In *Virchows Archiv* I described a case of hydrocephalus chondrodystrophicus—unknown until then. The skull of this monster has the appearance of having been bound by a cord. In an article about intravenous mola hydatiformis I noted that the so-called mola destruens is not in itself malignant but that the villi grow in the vessels of the uterine wall, and deeper than normally. This is not a sign of malignancy even when the uterus is perforated, but the proliferation of the chorion epithelium, which in a few cases goes ahead of the villi and through the vessel wall in the uterus, is malignant *(Archiv f. Gyn.,* 1924.)

At the beginning of 1924, at the Gynecological Society of Berlin,

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Bumm in his jovial and elegant manner spoke friendly words in honor of my sixtieth birthday; at the end of the same year he died suddenly abroad and I had to speak at his memorial service. It was a hard blow for the clinic to lose its chief whom everybody loved, assistants as well as personnel and patients. They all were in deepest grief, knowing that nobody could replace him as a philanthropic personality—one who had given to the clinic the imprint of his life's work. My personal relations with Bumm were pleasant from the first day, and he always set aside time for me when I had a request. We had an opportunity to spend more time together when he visited me twice in Brussels on his way to Ghent and back. He was at that time rector (president) of the University and as such had orders from the German government to establish contacts with the professors at the University in Ghent. That was about the time when Germany spread propaganda by a public exhibition in Brussels about the problem of compulsory insurance. It was clear that Germany intended to occupy some part of Belgium for several years at least.

After the death of Bumm I began to give one lecture weekly for the assistants in the evenings in order to keep them together in a common cause and continued with this until, after a long interval, Stoeckel was nominated as Bumm's successor. One could not easily find a greater contrast than between these two men. It was not easy to replace the lovable Bavarian personality of Bumm. Stoeckel, the more formal Prussian, although not amiable by nature, knew how to procure the respect of all by serious application and upright conduct. He exerted himself in behalf of the patients and of the clinic, to which he added a large modern wing. He had still further plans to rebuild and modernize the whole clinic. As editor of the *Zentralblatt für Gynäkologie* and the *Zeitschrift für Geburtshilfe und Gynäkologie,* he not only found time to found a new journal of gynecological urology, a specialty of his own, but also to edit the third edition of Veit's *Handbook of Gynecology,* to which he added three great volumes on gynecological urology. He was a gifted orator and an eminent teacher. A conscientious worker himself, he also had respect for my labors and he never disturbed them by insignificant demands. Otherwise, we were in many regards very different from one another; but after the first two years we grew closer together and became good friends. I never shall forget what he did for me from 1936 to 1939 when I had to leave him and the Clinic. He tried to facilitate matters for me by every means in his power. That was not only loyalty, it was real greatness.

I shall also not forget that when Professor Heller, the pathologist at the University in Kiel, died, Stoeckel proposed me as his successor. They chose Lubarsch whom they preferred and they were right. I was not prepared and was not desirous of giving up my agreeable position where I could work to my heart's content, and I was then forty-nine years old. Stoeckel had never been a National Socialist and remained neutral as far as he could. At all events, Stoeckel had no easy position, in spite of his having delivered two little Goebbels and one little Rust (Minister of Education). I have now learned that Dr. Stoeckel is not only alive but is still Director of the Clinic in his seventy-sixth year. He lives in a room of the clinic's ward for private patients since the other part of the clinic, including his private home, was completely bombed out. Three assistants were killed.

In the years 1924 and 1925 I wrote about dermoid cystoma containing a rudimentary fetus with two to four extremities *(Zentralbl. f. Gyn.* No. 34 [1924]; *Arch. f. Gyn.* 123 [1925]). I have described two cases of my own and three others of my colleagues. These are extremely rare monsters and they are of great importance for the understanding of dermoids in general. In most dermoids one finds a tuft of hair and glia, thyroid, teeth, etc.—all parts of the head. I call this a dermoid with free head-portion, while the other part is imbedded in the wall of the dermoid cystoma and becomes atrophic. In the dermoid with extremities, on the other hand, the head either is not developed or is less so than the lower part of the fetus which contains a mons veneris with pubis, a bladder and urethra, urachus, phallus with corpus cavernosum, prostate, glandula Bartholini and rarely an umbilical cord with the three typical vessels adherent to the navel and with the other end to the dermoid wall, a kind of placenta but only its vascular portion. The part of the head is sometimes distinguished by a hair pad, teeth, and the like. A. Plaut, in a recent publication, has described a case in which the rudimentary fetal imitation with three extremities was free on all sides from the cystic wall and connected with it by an umbilical cord. The literature is excellently discussed. Nicholson, an English pathologist, applies the organizer-theory of Spee-mann to explain these monsters and attempts to offer something contradictory to the older theories according to which the dermoids or teratomas were thought to originate from a blastomere, one cell of the early division (Marchand).

The organizer may or may not be present; in no case can the

organizer produce something from a cell in which the potentiality is not given beforehand. The organizer can only induce the cellular anlage to produce this or that of its multiple potentialities. The cell which has these qualities for all cells and organs and the four extremities and an umbilical cord and placenta-like membrane must have nearly the qualities of a sex cell. Contrary to Nicholson, one should say that an organizer is missing. The organizer, if present , should be found in the anlage of the dermoid, not in the developed monster.

In investigating the genesis of the dermoid there remains the fact, which must be stressed, that sex cells have never been found in the dermoid; I have always maintained that they could not be found there. This fact is far more important than the rare finding of the imbedding and rudimentary development of the head part in contradistinction to the common dermoid cyst in which the lower part of the body is included in the cystic wall and stunted in its development while the lower end is free to develop the extremities and the pelvic organs. There exists no plausible explanation for the similarity to secondary male sex characteristics.

I wrote a paper on chorionepithelioma which will also interest the clinician. I had twenty-eight cases of which twenty-one were reported extensively in the *Zeitschrift für Gynäkologie* [1927]. Among these were six cases with remnants of mola hydatiformis and seven cases with mola hydatiformis in their history and eight cases without hydatiform moles. A special kind of mola hydatiformis, the so-called hydatiform fibroangioma villorum chorii diffusum, I described upon invitation on the occasion of the seventieth birthday of Professor Morpurgo (Pathologist in Torino, Italy). Owing to the enormous proliferation of the fetal vessels and connective tissue, giant villi are formed which one can recognize macroscopically, the only cases in which the stroma of the villi grows independently *(Archivio per le scienze mediche* 50 [1927]).

In the *Zeitschrift für Gynäkologie* (1924), in *Virchows Archiv* (1924), and in *Deutsche Pathologische Gesellschaft* (1925) I published articles on adenomyosis and endometriosis. As early as 1909 I had observed that it was the stroma of the endometrium which had the ability to destroy other tissue, especially elastic tissues *(Virchows Archiv).* At that time it was not known that one tissue could dissolve another without being malignant. There was a similarity between inflammation and this dissolving potentiality that induced me to call it adenomyometritis. This was an

error and I had to struggle with myself a long time until I was at length persuaded that it was an adenomyohyperplasia and accepted the expression adenomyosis uteri et tubae (Frankl) and endometriosis from the Americans for the identical ectopic proliferation of the endometrium without musculature. This mostly occurs independently of adenomyosis of the uterus.

I found that the histolytic quality is not only responsible for the destruction of the interfascicular connective tissue but also for the musculature which undergoes necrosis to a greater or lesser degree. I had Kitai, my student, work on this problem and I described this later in the German handbooks of gynecology and pathology. I have been very critical of the hystero-adenosis metastatica of Halban *(Zentralbl. f. Gyn.* 1925) but in certain cases it may be true. The assumption is that the endometrium under exceptional circumstances gets into the veins and, through an open ductus Botalli or defect in the septum, into the left side of the heart. In the few known cases involving endometriosis in the axilla and in the thigh, no attention was paid to such a defect as far as I remember. I also described adenomyosis in a tube (1927) which since then has been described in the excellent work of Philipp and Huber but this contains no contradiction to my work.

In 1925 I described some anomalies and tumors of the blood vessels and the lymphatics not well known until then (*Archiv. f. Gyn.* 126: 609). These are partially telangiectasias, capillaries in proliferation similar to those in the skin. They lie in the inner muscle layers and partially in the mucosa. These as well as real angiomata of the uterus are, for the most part, congenital anomalies and are observed at a more advanced age but also during active sexual life. Adenomyosis complicated by angiomatous proliferation in one area is called "Adenomyosis partim angiomatosa." This causes a predilection for bleeding.

An interesting case was one of angiomyohyperplasia corporis uteri. The woman bled heavily. The whole inner layer of the corpus was thickened and contained a diffuse angiomatous proliferation of the capillaries with hyperplasia of the musculature. The endometrium was partially involved out to the surface. This woman (forty-five years old) had had three deliveries, the last one twelve years before, and later on one abortion. The most important case was that of the intramuscular "Lymphangio-cystofibroma." The cyst was separated by septa in some parts. The septa and the walls of the cyst looked fibromatous. Since that time

other cases have been described in our Institute which looked sarcomatous but were benign.

I found (*Arch. f. Gyn.* 1925) that granulosa cell tumors often, but not invariably, cause hyperplasia of the endometrium, which has already been mentioned in two single cases. This happens also in the menopause of aged women and even to such a high degree that carcinoma must be considered. I must state that in the case of granulosa cell tumor as well as in the case of theca cell tumors, this is accepted as true (meeting of the American Gynecological Society, 1945) by many gynecologists, but it was proved only in a few cases. Usually I asked the clinicians not to remove the uterus, and in no case did anything happen. On the contrary, after a curettage the patients were cured without exception, but the number of these cases is still too small.

In 1924, I opposed G. W. Corner because he introduced the name anovulatory menstruation. I do insist that one must not speak of *menstruation* unless there is present a corpus luteum which causes the premenstrual stage and without which, in turn, no pregnancy is possible. For the gynecologist it is clear that the reproductive apparatus serves pregnancy only and that the premenstrual (progestational) stage serves the nidation of the fertilized egg cell. If cyclical bleeding occurs, in the absence of a corpus luteum one must call this hyperplastic bleeding or precocious bleeding, but not menstruation. We must not be misled by the cyclical character of the phenomenon.

Some articles of Jaffé, a pathologist, on the function of the corpus luteum at the time of lipoid degeneration gave me the opportunity to restate my own conception. Nobody doubted the validity of it at that time, but it was necessary to make chemical examinations in conjunction with histochemical and histological ones to demonstrate it. C. Kaufmann, an assistant of mine, together with the chemists E. Lehmann and Kurt Raeth, analyzed by the newest chemical methods the lipoid content of the corpus luteum in all stages of its development and compared it with the histochemical effects produced in the same ovaries by various means. The result was absolutely clear: the chemical content of the corpus luteum in various stages did not change much while the histological picture, by Sudan stain, showed enormous quantities of lipoids at the time of postmenstrual regression and very little at the time of the peak of production of hormones, *i.e.*, during the premenstrual phase and during pregnancy. This was in absolute harmony with my results obtained merely by histo-

logical and histochemical methods. Interesting to a high degree was the discussion following a lecture of C. Kaufmann on the fat-metabolism in the corpus luteum in connection with ovarian function in which he stressed that my conception was right and in which particularly Aschheim, Jaffé, Zondek, Robert Meyer, and Kaufmann participated (*Zeitschr. f. Geb.u.Gyn.*91:669). C. Kaufmann and K. Raeth published their results in detail (*Arch. f. Gyn.* 130 [1927]; C. Kaufmann and E. Lehmann in *Virchows Archiv,* 261 [1926], and in the same, 270 [1928]). These works are classic in the best sense of the word.

In April 1926 Carl Ruge died at the age of eighty years. It was a sad event for the Berlin Gynecological Society since he had presented about half of his work in the form of lectures and demonstrations before this society. His bibliography is found at the end of the necrology which I was called upon to give in commemoration of him (*Zeitschr. f. Geb.u. Gyn.* 90 [1926]). I lost my best friend and a congenial colleague.

I had to deliver a report in Madrid (Spain) concerning the function of the ovary. This was on the occasion of the first national meeting of the Spanish physicians in 1927. They had invited from the European nations and Spanish-speaking nations in South America two physicians each to give a lecture, and the Spanish professors also did their best in performing operations in public and giving lectures. The meeting lasted a whole week and was visited by eleven hundred Spanish physicians, so it was a huge success. The Spanish doctors represent a high class of well-educated people and are amiable too. The pictures and caricatures of the foreign physicians were given in the newspapers and I was honored by the title of a "friend of Spain," perhaps because I gave my lecture in Spanish which I had learned in about four weeks. We also had to speak at the inauguration of the meeting and at a banquet in the presence of Primo de Rivera, the famous dictator, of all the ministers and high officers of the army, and of the whole foreign diplomatic corps. As an "Aleman" (German) I was the first in the alphabet to speak, unprepared, of course. At the opening of the meeting I spoke of the very famous anatomist, Ramón y Cajal, to whom a monument was erected in the heart of Madrid during his lifetime and who was named a Nobel Prize winner at the recommendation of our anatomist Waldeyer. He was still living at that time but he was ill and no one could visit him. At the banquet I gave utterance to my feelings as the "friend of Spain" and praised Madrid as a city of high culture. They have there the "Prado,"

a museum of arts which has not many rivals in Europe. I was not shy about calling things by their right names and told them that the "Facultad de Medicina," where we held the meeting, was not up-to-date nor equal to the efficiency of the professors who had to work there. The progressive physicians were filled with enthusiasm by that utterance; but not so Primo de Rivera who looked surly. In spite of that I was named a Knight of the Order of Art and Sciences. The officers of the meeting sent me a beautiful decoration which I never have worn but have preserved in the original case as a fine remembrance of Spain. (I heard afterwards that they built a modern hospital.)

After the Spanish report about the function of the ovary and especially the corpus luteum, I compiled a critical review of the same topic for the *Berichte* (the reports of gynecology and obstetrics, January 1928), a periodical which publishes abstracts of the international literature. It was the first of its kind and contained both the histological and functional research dealing with the importance of the lipoids in the corpus luteum furthering the chemical analysis, the biological lipoid extract, and others. It included the special hormone research and dealt with the effect of hormones on functions of the ovary, its dependancy on other organs, primacy of the ovum, the hypophysis, and sexual specificity, and also with the influence of ovarian hormones on the whole body and its organs and the practical application of the hormones. At that early stage of the hormonal doctrine there already existed about two hundred fifty publications on the subject.

The literature has since been augmented and was critically reviewed by myself in the chapter on Menstruation as well as in that on Function of the Placenta in the *Handbook of Pathology* (1930). Zondek and Aschheim had pushed the hormone of the hypophysis into the foreground of the rhythmical sexual function, but I maintained that the ripening of an egg cell was the principal factor. Why does prolan favor one or two follicles of many? The prolan does not simply choose any follicle but selects only those whose ova are the ripest ones. The prolan is not the cause, certainly not the first cause of maturation of the ovum.

The main point of the biological conception is not the inquiring as to which of the conditions has priority. All of them are more or less indispensable, and the question as to which of them has the temporal priority merits still less consideration. If we were to ascribe priority to one point, we could not stop with the individual life but should have to

go back to the beginning of life. The theory of the priority of the egg cell has no bearing on the concept of time, but concerns the concept, self-evident at the present, that the total function aims at fertilization and pregnancy and therefore at the preservation of the species. It is clear that the prolan cannot act cyclically on one follicle but that the ripe ovum, if not fertilized, makes the cycle. It is known, for example, that the thyroid influences the cycle also and it is known how many organs the ovary influences. It is always the same; the fact is overlooked that everything that happens in that early stage is of basic importance for pregnancy but I fear this will not be understood by everybody.

This period of my life was very exciting for me since I had to fight for the proper application of the diagnosis of cancer and its usefulness against the theoretical but illogical opinion that a carcinoma could not be diagnosed before it had invaded the underlying tissue (Borst, *The doctrine of the tumors,* 1902). Twenty years later, in 1922, at a meeting of a part of the German Pathological Society, I had to repeat the struggle against the majority of the members and especially against their president, Lubarsch, who asked me what this question had in common with pathological science. I answered him: "All or nothing, for this question means life or death for wives and mothers." I had already published some cases which were very carcinoma-like but not malignant, among others a case of syphilis of the uterus (*Zeitschr. f. Geb. u. Gyn.* 84 [1922]), and papilloma of the portio uteri (*Archiv f. Gyn.* 115 [1921]). In the Gynecological Society (*Zeitschr. f. Geb. u. Gyn.* 91 [1921]) I had stressed the view that the diagnosis of cancer was merely empirical. If one compares "scientific" with "applied" pathology and believes that the first is more important, then I would say in contradiction, "that which in practical experience has proven to be right must influence the theory and overthrow the theory." Theory always may be in error. I recognize three changes in cancer: 1) changes in the epithelium itself; 2) a change in the relation between epithelium and connective tissue; and 3) destruction of tissues. If one demands that the last should be present to make a diagnosis of cancer, it is possible that a serious mistake will be made. One must learn to make the diagnosis of cancer earlier (*Zeitschr. f. Geb. u. Gyn.* 91 [1927]).

One year later (1928), I was invited to lecture on cancer diagnosis at a combined session of surgeons, gynecologists, and pathologists of the German Society of Natural Scientists and Physicians in Hamburg (*Zen-*

tralbl. f. Gyn. No. 43 [1928]). This was the first time that anyone had been allowed to speak on cancer diagnosis in the presence of pathologists. It was a great success, so great that they decided to discuss diseases of the breast the next year in accordance with my suggestion. With my students, Kaufmann, Höhne, Hirsch-Hoffman, Baniecki, and Hintze, I followed the patients and found that my diagnoses were correct and justified by the clinical and operative results. I described the early stages of portio cancer in *Surgery, Gynecology and Obstetrics* in July and August 1941 and lectured on it at Minneapolis, Chicago (Bacon lecture), Rochester (Minnesota), and Detroit (Michigan). I have the impression that in the United States theoretical considerations are not opposing practical experience as was the case in Germany, where forty years after Carl Ruge and after twenty years of my labor this dilemma persisted. There are only a few gynecologists trained for that special field. This opinion was also shared by Te Linde in 1945. It was announced at a meeting of the German Pathological Society (1935) that pathologists henceforth should study and be examined in practical diagnosis. The necessity for this cannot be denied and it may help to promote knowledge of biopsy, which is still most important and expedient in gynecology. There are never enough gynecologists who take this seriously or who can make differential diagnoses between a harmless polyp of the cervix with a high degree of harmless epidermization and cancer. I am sure that in fifty years there will be a generation of men conscientious enough to understand the trouble and that they will be informed enough to propagate the knowledge which is now in its third generation and advanced enough to occupy many special pathologists trained in this field. The struggle for the diagnosis of cancer has cost me many sleepless nights. It is the only means which can bring about early treatment; therefore it should be officially appreciated and promoted by education.

I doubt that the cellular diagnosis of Papanicolaou and Traut will replace the excision for biopsy. It stains the cells, which, being necrotic, are sloughed off. When the nuclei of the cells are stained brown, they are dead. I recognize the cancer when it is still quite superficial and when the nuclei of the cells do not show the reaction of Papanicolaou, and I recognize them when the cancer develops in the basal layer of the leukoplakia of the portio, when the cells cannot be set free because they are retained by a thick squamous layer. I do not believe that the recurrent cancer after irradiation can early be recognized from the cells which are

sloughed or cast off because it starts from the non-irradiated cells in the depths of the tissue which are protected by the scarred connective tissue. I would not like to be misunderstood—I doubt that this method can replace biopsy. I will not say "omit it"; on the contrary I would say "try it." In many places in this vast country it may sometimes be impossible to do a curettage or excision. But how to teach the country doctor to interpret a vaginal smear? I myself can see the cancer cells in the smear stained by hematoxylin as well as Papanicolaou can by his special method of staining. Why complicate the examination? I repeat, it is more expedient to teach pathologists the histology of the cancer.

1930 – 1932

We, like many others, had prepared an estrogen extract "Hogival," based on the principle that the hormone is not produced pure but is mixed with lipoids and other materials because at the time of high function in pregnancy the free lipoids disappear in the corpus luteum, a fact that I had always stressed. With the chemist H. Wulk I published an article in 1930 (*Archiv f. Gyn.*, 143) on this topic. Generally the year 1930, considering the number and volume of publications, seems to me astonishingly great in retrospect. I published in *Virchows Archiv* (275) on cartilage and bones in the female sex organs and on the same subject in the *Zentralblatt für Gynäkologie.* Relative to the nature of ovarian tumors leading to masculinization, I published an article in *Zeitschrift für Geburtshilfe und Gynäkologie* (98), and another about arrhenoblastoma ovarii in the *Verhandlungen der deutschen pathologischen Gesellschaft.* "Ovarian Tumors and Sexuality" was the title of a lecture given upon invitation in Ghent at the two hundredth anniversary of the death of the famous anatomist, pathologist, surgeon, and obstetrician, Jan Palfijn, who invented and described the first forceps (1721). My Flemish colleagues dedicated a monument to him and had a three-day festival at which Ludwig Seitz, Hugo Sellheim, and I participated as representatives of the German Gynecological Society and of the Berlin Gynecological Society respectively. I made the acquaintance of Seitz, a very serious-thinking author, and renewed my friendship with Sellheim whom I had visited in 1898. Sellheim was then assistant to Hegar in Freiburg who had greeted me with the words: "Ah, you are from Berlin where people can recognize carcinoma in the microscope." Hegar was not yet con-

vinced that it could easily be done. Sellheim was a talented man but once when he visited me in Berlin he admitted to Mrs. Meyer's and my great astonishment that he could not understand why people should render songs at social gatherings; one might do that in the woods but not in the drawing room.

The lecture on "Ovarian Tumors and Sexuality" also appeared in the *Klinische Wochenschrift* in 1930. An elaborate work on this topic had first been published in honor of the pathologist, Eduard Kaufmann, who wrote the world-famous textbook of pathology. On the occasion of his seventieth birthday, a "Festschrift" appeared in the *Beiträge zur Pathologie* (Vol. 84, 1930) in which I was invited to participate. This work had an important supplement in a lecture before the Gynecological Society in Berlin (*Zentralbl. f. Gyn.,* 54 [1930]).

In this same year (1930), I completed my two largest works in Stoeckel's *Handbook of Gynecology* (Vol. VI, Pt. 1) and in Henke-Lubarsch's *Handbook of Pathology* (Vol. VII, Pt. 1). The former was nine hundred pages in length and the latter eight hundred pages. Although these works kept me busy for many years and had been preceded by many detailed publications, their publication in the same year as the work on ovarian tumors was an indication of extraordinary capacity for work. I was then sixty-six years "young," as my friends used to remark. The whole work was written and rewritten by hand three times.

In the *Handbook of Gynecology* one finds more detailed studies on adenomyosis and the tumors of the connective tissue, *i.e.,* fibroma, myoma, adenomyoma, angioma, sarcoma, chorion-epithelioma, and mola hydatiformis. Philipp, who together with Huber brought out an important contribution to the doctrine of adenomyosis and endometriosis, said he had studied my work (two hundred pages) and had not found one word which I would have to withdraw. This is indeed an example of objectivity. (Peter Grünwald, the embryologist in Boston, insists that endometriosis may arise from the coelomic epithelium.)

The last work mentioned contains 418 illustrations, for the most part original, of which 67 pictures concern chorion-epithelioma. It is a pity that there does not exist an English translation of this book. I spoke before the Central Association of Gynecologists and Obstetricians on chorion-epithelioma and mola hydatiformis, but publication of this address was not possible because it had already appeared in German—as if every American gynecologist who is interested in this topic could read

enough German to understand these difficult problems. Moreover, that address presented a new principle and point of view: namely, the parallelism between the two kinds of chorion-epithelioma and the various stages of pregnancy. In the first two months the chorion-epithelium of the normal ovum dissolves the maternal tissue without any resistance. There are chorion-epitheliomata which do the same for months without coagulating the maternal tissue. On the other hand there are cases of chorion-epitheliomata, especially accompanied by hydatiform mole, in which the decidua and the other maternal tissues react with a broad zone of coagulation like the decidua in normal pregnancy of three or four months. The difference between the two types seems to be the type of chorion-epithelioma, which grows faster and dissolves the tissue, but it may also be the maternal tissue which reacts more or less by coagulation. There are also many other interesting points in the doctrine of hydatiform mole and chorion-epithelioma.

The *Handbook of Pathology* brought up to date the whole pathology of the uterus, including its malformations, and shows the tissue anomalies during development. The first portion of the book contains 353 illustrations; the chapter on chorion-epithelioma has 71 additional pictures. Moreover, this work contains so many new observations and ideas that it is not possible to mention even a part of them. I regret that I am unable to have my American friends participate in the satisfaction I myself derive from both of these books, since they are original throughout and contain rather complete indices of the literature besides.

At the end of that eventful year of 1930, I began to learn a little English. I knew enough to understand what I read and to make abstracts for the *Berichte* but I could not speak it. Then I was invited by the American Gynecological Society to give a lecture. I received from W. P. Graves the cabled invitation which I showed to my wife, raising the question whether I should accept or not. After a long debate, in which my age of sixty-seven played a rôle, my wife gave her consent and said after a while, "But must you not accept by cablegram if you decide to go there?" When I answered, "I have already done that on my way home," she replied, "I have always said you are an adventurer." Eight years later, in 1939, when I had to leave Berlin and asked my wife, "I have the opportunity to go to the U. S. A.; would you like to come along?" the answer was, "Naturally; do you think I would stay here alone?" I answered: "I have always said you are an adventuress."

It was a great pleasure to cross the ocean the first time at the age of sixty-seven years. For some days there were only a few at the tables, so I knew it was somewhat stormy. I found an old lady who was inquisitive as to what I was to do in the United States, so I gave a rehearsal of my paper to her and she was kind enough to polish my bad pronunciation. The grandiose view from the entrance of the harbor of New York simply overpowered me, although I had seen it often in pictures. A quarantine commission came on board ship and with them two young journalists who asked me first how I liked America and then on what I intended to speak. I answered that America was a wonderful country although I was here for the first time, and that I would speak on the art of changing women to men and vice versa. They made some notes in their books —I don't know what they were about. At the pier stood Rubin and Klemperer, the pathologist without whose help I would have had to pay duty for the import of my diapositives. Rubin, with whom I have since been very friendly, took me first to the Empire State Building and then to Hot Springs, Virginia, where on the next morning I was heartily welcomed by Graves, the president of the Society. I had just time to wash myself before giving my lecture. Emil Novak discussed my paper and earned as much applause as I, and that was fair. After the meeting, at which I made many friends, I visited Baltimore, Philadelphia, Rochester (New York), Buffalo, Chicago, Boston, and New York, and was everywhere received in an especially amiable, cordial, and goodnatured manner which one does not find in any other country. In some of these cities I spoke alternately on cancer diagnosis and ovarian tumors. In New York I spoke to the German Society of Medicine, whose president was Arthur Stein, the former assistant of Lubarsch. The New York Society of Obstetricians had invited me for a dinner where there were veritable streams of French champagne. (It was during prohibition.) My sojourn in the United States lasted altogether sixteen days and I left with a promise not to write a book about America. It was a fine time—one which I could long revive in my memory.

The topic on which I spoke in Hot Springs, Virginia, and elsewhere later, was "The Pathology of Some Special Ovarian Tumors and Their Relation to Sex Characteristics."

(1) The granulosa cell tumor occurs in children, in whom it induces sexual precocity, and in old women, in whom it causes hyperplasia of the uterus by estrin. (There are tumors containing much lipoid, which is not identical with the luteal

hormone. In such cases the endometrium should be in the secretory stage, which happens extremely seldom.)

(2) I presented the disgerminoma, which is often accompanied by intersexuality and occurs in the testicle of men as well as in the ovary and is often called seminoma in France but has nothing in common with either semen or with seminal tubules—hence the name is misleading. Such tumors arise from a type of cell which should become sex cells, but for some unknown reason lose that property. It is clear that these cells have to do with intersexuality and they occur also in intersexual sex glands, but remain as single cells in healthy fertile women. They do not change any sex character. That they may be complicated by teratoma in men has no importance for their histogenesis except that both are left behind at a very early stage in development. Similar cells are found in the bisexual glands of the intersexes. The genesis of this tumor should be in the foreground of further discussion instead of arguments about the spelling of the word, which should remain a "querelle allemande." Webster says "dis" is in English a prefix denoting: (i) reversal, undoing, depriving, or negation; (ii) undoing or depriving of a character or quality. This is what my theory was meant to express—the losing of a quality. Webster contains eight pages of English words with "dis" and only eighteen words with "dys." But, for myself, it is absolutely unimportant whether one spells disgerminoma with a "y." I must say only that this question does not need to be discussed so much in America.

(3) Finally I showed the arrhenoblastoma in its three appearances or types. The simplest type is that of the adenoma ovarii tubulare testiculare, which in the minority of cases masculinizes the patients. The majority of patients remain healthy after operation. The lesions indeed may become carcinomatous and the patients die of the tumor without being masculinized. Why? Because the individuals are different in constitution, and the tumor also.* There is an intermediate type of tumor which defeminizes only, and others which masculinize to a certain degree. It is naturally quite the same whether in a special case the tumor belongs to the first or to the second group. The latter may occur more often than is known. The main point is to show that there exists an intermediate class; it may be painful to my adversary to learn that meanwhile there has appeared in the German literature one case of this middle class and also some American cases have become known. Within this middle class with tubules, there exists also a type transitional to the third class—fully atypical arrhenoblastoma—in which are found only a few tubules if any. Clinically, they produce the greatest number of symptoms of defeminization and masculinization, which disappear when the tumor is removed. Without the existence of that middle class with numerous tubules, one would not recognize that the adenoma testiculare and the fully atypical tumor of the third class belong together histogenetically. But there already exist sufficient cases to prove this. It may be that even the completely atypical tumor does not masculinize the patient, but I am not yet convinced of some cases in the literature in which no sign of masculinization appears to have been detected. I know from a case of Wagner and some of my own that one may overlook the symptoms. Popoff described an interesting case of an "adenoma testiculare" in which amenorrhea was the only symptom of defeminization with menses reappearing after removal of the tumor. Meanwhile the literature became voluminous and confirmed my conception. A special kind of tumor exists—

* There are people who do not know this; otherwise I would not have to make this superfluous statement.

one which by its diffuse growth sometimes resembles the granulosa cell tumor. But it may be that the latter would be still less frequent if they were examined more extensively. The gynandroblastoma, which I predicted, may be one of these tumors. There is still much work to be done with such cases.

Finally, I stated that there exists another class of tumors which masculinize—the adrenal tumors which also occur primarily in the ovary. Also, these tumors differ insofar as masculinization is dependent on the greater or lesser degree of atypical growth. Whether the tumors of Sellheim, Cosasescu, and others may have been of adrenal origin, must be decided on the basis of the presence of transitional forms or the lack of them. Certainly there exist primary adrenal tumors in the ovary with adrenal structure which masculinize, but tumors such as those of Sellheim, Cosasescu, and others mentioned as being found in the ovary do not exist in the adrenal organ.

Without knowledge of my German work one should not criticize those tumors like a dilettante. The *American Journal of Obstetrics and Gynecology* published only an extremely short abstract with some errors in the legends under the pictures (which were not sent to me for correction). There are some authors who believe that they should find in the hilus of the ovary the germs for our tumors. Their work as such is excellent but insufficient because it has no logical connection with the "probability" of my theory that the germs as such have a male direction and because the arrhenoblastoma occurs only in one woman in a million. I have been extremely fortunate in finding a very small adenoma tubulare in the hilus of the ovary next to the rete (*Arch. f. Gyn.* 145 [1931]), and have described in "Studies on the Pathology of Development" (1914, Vol. II, p. 82, Fig. 1) a marked development of medullary cysts in the ovary and pathological proliferation of the rete (p. 89, Fig. 2). Such findings should not be overlooked. I may say that I often found medullary cysts in those parts of the ovarian stroma which may be said to invade the hilus in the shape of irregular pyramidal strands.

Adenoma tubulare in the hilus is described (1931) in a voluminous study on the anomalies of the ovary and their relation to the tumors of the ovary. This work is significant enough to merit a résumé of its contents. Some of the tumors by their similarity to normal tissues and their function cause one to surmise their origin from special cells, for example, the granulosa cell tumors, but rarely can we surmise the starting point or the degree of differentiation. One has to look for them especially in malformed organs, in healthy parts of the organ in which the tumor is formed, and in the healthy or rudimentary organ of the opposite side, when they are bilateral. A disgerminoma does not arise inside the seminal tubules but invades them and grows in them until it breaks through

again but this time from the inside into the surrounding tissue. This is the only difference from the otherwise identical disgerminoma of the ovary. This and their concurrence together with intersexuality permits one to suppose that they arise from primordial sex cells which, partially by intersexuality and partially by local disturbance, have lost their specific quality of forming definite sex cells and have acquired therewith the faculty of indefinite proliferation. Indeed, I had as early as 1925 described the ovariotestes on both sides of a newborn, in which lay indifferent tissue with interstitial cells but no marked genital cells, at the borderline between the ovarium and the testicle.

I established a connection between disgerminoma and these cells in the sex glands of the intersexes (*Archiv f. Gyn.* 123 [1925]; also *Zentralbl. f. Gyn.* 49 [1925]). In a case of ovariotestis in an adult a disgerminoma was found in the female gland and not in the male organ, and on the opposite side there existed a large disgerminoma as well (case of Polano which I had the opportunity to re-examine). Very often the other ovary is found to be aplastic or rudimentary.

I found also in cases of aplasia and dysplasia of the ovary (*Archiv f. Gyn.* 145 [1931]) rudimentary tubuli partially in a mass of epithelioid cells. In the ovary of a girl in her twelfth year, with a large granulosa cell tumor, there were some islands of granulosa surrounded by epithelioid cells and large masses of epithelioid cells similar to interstitial cells in the mesovarium. In the same work I described testicle-like tubules as a constant finding in cows and likewise in the ovary of anthropoids, and a ganglioneuroma in the hilus of the ovary of an old woman and a nodule of adrenal cortex in the fetal ovary. In connection with these and other findings I discussed the histogenesis of ovarian tumors.

A publication followed (*Zentralbl. f. Gyn.* 1931), on fibroma, myoma, and congenital polyps of the urethra; both works were written to honor W. Stoeckel on his sixtieth birthday. At the end of 1931 I began to publish on Brenner tumors; a lecture appeared in more detailed form in 1932 (*Arch. f. Gyn.* 148; *Zentral. f. Gyn.* 56). I called this "Brenner tumor" because Brenner was the first who gave a good description of it. However, he overlooked the fact that this tumor has another essential part, namely pseudomucinous cysts, and is sometimes found in a cystoma. This I pointed out by the presence of the typical Brenner epithelium. Sometimes the tumors were considered as or were suspect of carcinoma. That they are harmless is proved in many cases that have been published

since. One traces them back with some reason to Walthard's cell rests, but groups them with the serosal epithelial nodules which appear very often on the tubes and broad ligaments under adhesions, but not on the ovary, as I have noted above. They may be very large but so far as is known they do not participate in tumor proliferation, as I must state in opposition to Plaut. With this my work on ovarian tumors was completed, with the exception of the so-called Löffler-Priesel tumors which I also knew. But I could omit them since they had been excellently described. It was in 1897 that C. Gebhard, for ten years a student under Carl Ruge and the author of the first complete textbook on gynecological pathology (Leipzig, 1899), asked me if I would try to describe the ovarian tumors. But I had to work on many other things before I could describe the struma ovarii, mentioned above, in 1903. So the work on this problem took me almost thirty years. The literature was confused and the tumors were rare.

At the end of 1931 I lost my only son from endocarditis lenta in Bern, Switzerland, where he was bacteriologist at the University. It is strange that his predecessor died of the same illness, which is known as being rare and caused by streptococcus viridans. It is grievous to outlive one's own child, especially when he was such a robust man and at the zenith of his career. He wrote some interesting works in his special field. He was an excellent pianist. With his widow I carried on a correspondence during the war since she now lives in London and is working as technical assistant to Dr. Pagel, a pathologist from Berlin whom I had known casually. Professor Louros, in Athens, Greece, a former student of mine, wrote me, "You have so many sons in all parts of the world"; but that is not the same, for the thread of life is cut off when one loses one's own child. It is true, I have so many students whom I treated as my sons and who loved me as their father—that I am to be envied. They all found wonderful positions in gynecological clinics, and some of them as pathologists, and remained grateful students even after leaving me.

On the 23d of February 1932 I was nominated Honorary Professor in the Medical Faculty of the University of Berlin, the greatest honor which the University has to bestow on a person. Some years later, I think it was 1935, Hitler was malicious enough to deprive me of that honor. I do not sleep so well since!

Apart from the Brenner tumor, I demonstrated in 1932 the so-called "Myoblasten myoma" (Abrikossoff) and published a study about the

same topic (*Virchows Archiv* 287 [1932]; *Zeitschrift f. Geburtsh. u. Gyn.* 104 [1933], the latter also treating the development). The myoblast tumors arise from a special kind of myoblasts which form the muscles of the throat and mouth region and also the muscles of the skin. They therefore occur mostly in the tongue and in the upper jaw. In one of my cases the tumor was situated in the skin of the breast and was mistaken by another pathologist for a carcinoma. I examined a case in which the tumor hung by a pedicle from the upper jaw of a new-born child. It was of the size and shape of the kidney of an adult. Without the quick and resolute separation of the tumor from its pedicle by the obstetrician the otherwise healthy child would have suffocated. Anyone who knows the development would not confuse these tumors with a tumor in the uterus as one pathologist in Berlin did. (It was a decidual adenomyosis in pregnancy.) In this same work I described also the new formation of striated muscle cells in a case of endometriosis in the scar of the abdominal wall.

In the year 1932 I had to struggle against Moulonguet, a French pathologist, who would not recognize the proliferative stage of corpus luteum because he had not seen it, just as generations of anatomists and pathologists and gynecologists had failed to see it because it is not yellow. According to Moulonguet, the proliferation of the granulosa cells occurs at the same time with the vascularization stage. I was compelled to describe and demonstrate fifteen cases of that young stage of pure proliferation. My former students, C. Kaufmann and S. Aschheim, seconded me with autochrome microphotographs of their own cases (see: *Zentralbl. f. Gyn.* No. 20 [1932] and *Arch. f. Gyn.* 149 [1932]). I availed myself of the opportunity to say, "If a teacher may be proud to be surpassed by his pupils, then I may compliment myself as a happy man." Aschheim, the famous inventor of the Aschheim-Zondek reaction, had been my assistant for four years and Kaufmann, an excellent biochemist, had also been with me for a long time.

Moulonguet would not be convinced although the photographs were overwhelmingly clear. The French are often vain, as you know. I once found in Paris a serious book in which it was baldly stated that the old Netherlands art of painting came from France. They were always "à la tête des nations," *i.e.*, the leading nation. There was a young Frenchman called Watrin who detected the development of the corpus luteum fifteen years later than I, but he claimed to have discovered it and was

not shy in applying my nomenclature to the different stages.

In 1932 I wrote about "Cysts in the Vaginal Wall of Fetuses of Three to Five Months" (*Arch. f. Gyn.* 151 [1932]). It is different whether one finds these cysts in the vaginal wall of young fetuses or in older ones after the Müllerian epithelium is replaced by sinus epithelium. Those cysts from the Müllerian epithelium lie in the median plane as do also the cysts in the uterus. This was the beginning of my studies on the development of the vagina published in five parts in 1934, 1936, 1937, and 1938 in the *Archiv für Gynäkologie,* the co-editor of which I had been for a long time.

Work was indeed an escape at that time of isolation, not only in the political but still more, in the ethical and moral sense, under the Nazis. I mentioned in a conversation with Dr. Roessle, our pathologist and a man as honest as he was clever, that in the last analysis Hitlerism was a struggle of the body against the intellect. Occasionally I called it the vengeance of the gnomes against the spirit. In view of these things my escape to embryology from the ovarian tumors becomes understandable. It was "constitutional embryology" which kept me captive for years to come. For this work I used 112 fetuses cut in series; of the largest ones I used only the pelvic organs and 14 others I used for the anomalies; I made about three thousand microphotos (9 x 12 cm.) and collected them in five great albums which I dedicated to Dr. Stoeckel. These were preserved in the library of the Universitets-Frauenklinik in Berlin. I wonder whether they still exist? I have heard that the clinic has been destroyed.

About 420 microphotographs were also used in the publication of my work which appeared in five parts in the *Archiv für Gynäkologie* as stated above. A special part about malformations was described on the occasion of Stoeckel's sixty-fifth birthday *(Zeitschrift f. Geb. u. Gyn.,* 1936). Also, a case of hematocolpos of an adult as an essential part of these studies was described in 1938 in the *Zentralblatt für Gynäkologies.* The main conclusion is that the Müllerian epithelium prepares the way but does not persist. It is replaced by the sinus epithelium, which enters the vagina at its caudal end (from below) and grows upward, in the lateral parts earlier than in the median part. Here, Müllerian epithelium persists readily and ripens to form mucous epithelial cysts. The sinus epithelium does not stop at the os externum but enters the cervical canal (fetuses 200 to 250 mm.), replaces the Müllerian cervical epithelium which ripens later to mucin-producing epithelium. The first and best proof for

this typical development of the vagina is that it never happens that the Müllerian epithelium undergoes a "metaplastic" island-like change here and there but that the sinus epithelium grows steadily upwards and ripens in the same direction forming the vaginal lumen by decay of the central parts. A second proof is that the Müllerian epithelium persists in cases of vaginal occlusion and ripens like cervical epithelium because the sinus epithelium cannot replace it. This differentiates the congenital defect from the acquired atresia.

There are too many interesting fine points to mention them all. The hymen, for instance, originates in the lateral parts of the vestibulum and may be formed without any co-operation of the vagina, which forms as a rule the posterior parts of the hymen by pressure of the vaginal content on squamous epithelium. It is therefore incorrect to speak of atresia of the hymen, because the opening in it exists from the beginning. It could be occluded secondarily by inflammation or a similar process.

The fate of the Wolffian ducts is also extraordinarily interesting. The caudal or lowest part of them is replaced by sinus epithelium which grows as very irregular bulbs (Mijsberg) around the Wolffian ducts. A. Koff designates the same as sinovaginal bulbs which, in his opinion, are to be considered as helping to build the caudal part of the vagina. This is wrong. Actually the bulbs originate first as very wild proliferation of the sinus epithelium around the caudal ends of the Wolffian ducts, but not independent of them, and very often contain remnants of the Wolffian ducts. Later on, their contours are smoothed to ordinary sinus squamous epithelium in which remnants of the Wolffian ducts are seen. The ends of the Wolffian ducts do not migrate with Koff's sinovaginal bulbs but their lumina disappear temporarily in the bulbs and sometimes reappear as openings through the bulbs directly into the sinus as is the case in the male also. These relations are easily recognized in my pictures.

The embryonal development is constitutionally or individually different, so that one cannot judge the norm from a few examples. It is very necessary to examine more extensively in order to recognize the differences which are caused entirely by constitutional factors. So one must speak of constitutional embryology just as one speaks of constitutional anatomy (W. Brandt). By calling special attention to this, it is easy to show how peculiarities turn to malformations; for instance, the persistence of the Wolffian ducts or the septum urorectale (which is physiological and of minimal extent in young embryos) is the cause, however, of human

biforis or even vagina infima duplex if persisting to a greater degree. In cases of orificium vaginae duplex this is also demonstrated. The persistence of the septum vaginae is caused by constitutional differences in the relationship of mesenchyme to epithelium, which also plays a rôle in the normal development of the vagina. The Wolffian ducts never participate in the formation of the vagina. This enormous work I undertook in my seventieth year in 1933, in the sure expectation of disclosing some new aspects, and it helped me over many disagreeable years.

* * *

Reading the foregoing pages one might think that I no longer had time for any private life. To be sure, it was no longer as it had been in earlier years. In growing older one had to husband one's time for science. I remember that during the years before 1930 I was almost always in a race against time to get through with the two handbooks and the ovarian tumors. I was sixty-six years old and one did not know how long one might live. I had to think often of my favorite painting by Arnold Böcklin, a self-portrait, in which the painter is shown in his best years painting on an easel while he listens attentively to a violin close to his ear played by Death. A grandiose conception of introspection.

But we had our friends after the war as we had had them before. The Ansorge children married early and one of their daughters-in-law, a student of Ansorge, often came to see Mrs. Meyer and to play the piano for her. Since she was from Brazil and her husband received a stipend to study folk songs and fairy tales in South America they went to Sao Paolo between the two wars. She was a very good friend of Mrs. Meyer's and corresponded with her. The correspondence has been carried on with me up to the present. Other friends, too, were not shy and visited us in our home in spite of Hitler. Among them I should mention Mrs. Gertrude Eisner in Berlin and Mrs. Liese Niederstein, the wife of a clergyman, with her family. Sundays we always had visitors, especially former assistants of mine. Other friends withdrew one after another upon our own request because we did not want to get them into danger politically. During the last years we were forbidden to enter restaurants, cafés, theatres, concert halls, or motion picture theatres and to sit on the benches in public parks, except some that were especially designated. But since Mrs. Meyer was growing older and was often ill, she did not miss it very much and learned to esteem the company of our little dog which she had, so to speak, picked up in the street. It was an orphan since the lady who

owned it had died. The dog soon was our best friend. The reader will understand what my work meant to me—and we were not forbidden to play music.

But we always received calls from our few relatives and some very close friends, like a son of Carl Ruge, a solicitor named Ludwig and his wife. He wrote me a short time time ago that his house was damaged several times but preserved. Every time the house was damaged they had to go and repair the roof with new tiles which they had to carry from far off. His wife had broken her thigh and had to lie in a basement for six weeks. The worst time was that of the occupation with the inevitable plundering. Now they are recuperating from malnutrition. His son lived in England and had to fight on the British side for several years. Our daughter married an Italian in 1937 and from time to time came from Italy with her husband to visit us.

Before the first war, a fine musician, Joseph Hübner, who was a friend and a student of Ansorge in whose house I met him, gave piano lessons to my son. We were very good friends and played billiards while a friend of his, Augusta Götz Lehmann, who was a brilliant pianist, played the piano together with my daughter. She was a prodigy and gave concerts when still a child. They lived in the same house with Melchior Lechter. Lechter had started as a mason but was soon known as a painter on glass and worked for churches everywhere. He also painted wonderful pictures in deep rich colors and illustrated beautiful books of mystical content. He had been in India, which he described in a marvelously illustrated book, even the precious leather cover of which was decorated. He published this book, like his others, on subscriptions. I met the author in Ansorge's house and came to know him as a man of universal culture and learning. Although not a musician himself, he knew by heart all the works of Richard Wagner, note for note. No wonder that he was a good friend of my friends who played for him on the piano all the classical four-handed chamber music that was available as well as other music.

Melchior Lechter could laugh like an earthquake. He was a friend of Rainer Maria Rilke* and after the poet had passed away in Switzerland, Lechter wanted to paint his friend's grave; suddenly he dropped from his chair and passed away. After his death a gallery arranged an

* An American translation of the poetry of the greatest lyricist is in existence. To get an impression one may read Babette Deutsch's *Selected poems.*

excellent exhibition of his paintings and drawings. But I was not able to buy them.

My friend Joseph Hübner bought a small farm in the mountains of Silesia after the war, since he loved nature more than anything else with the whole intensity of his explosive temperament. Once we heard a forceful singer from Prague over the radio, a baritone who sang in Hebrew, a language we did not understand. It was no longer singing, it was a continuous, inflamed, and uncivilized outcry by a tormented soul, sometimes furious like a prophet of the old Testament, stirring a trembling agonized people. It was as if he anticipated Hitler. We all were deeply shocked. Hübner ran through the room with long steps, his eyes sparkling in his deep red face, fidgeting around with his arms and roaring: "That is the highest degree of art I ever heard, this is nature itself." And nature was to him the expression of deepest adoration. He needed at least a quarter of an hour to calm down. That was Hübner when we were alone, that was he when he was at his best, and he was at his best most of the time when I was a guest in his house. The house was a solidly built farmhouse with rooms enough for six persons to live in. But after his marriage to Auguste Götz Lehmann there were only two except when the old parents or friends came to visit them.

He had furnished the house with heavy furniture inherited from his grand- and great-grandparents and with some very fine old pictures of them. The cupboards with their glass doors were filled with antiques, silver, glass, and china. The most interesting contrast between the farmhouse outside and the museum inside was brought out by six mystical drawings by Melchior Lechter. Some portraits of great musicians like Liszt and Mahler or of Stefan George, the poet, were just right to serve as a link between the realistic furniture and the mystical exhibition on the walls. The relatively large library served Hübner very well for he was in reality two entirely different persons. The one was filled with fanatical enthusiasm for the mystical literature of old times (like St. Augustin and Jacob Böhme) and would read in monastic seclusion or play the piano, forgetting about himself in luxurious devotion to the composer. The other person was the eternally young boy, full of frolic, always ready to have a good laugh over an old joke and to play practical jokes himself. In between he was a careful manager with an extraordinary sense for cleanliness and order on the farm and in the house. They lived

on the products of their farm, exchanging them with those of neighbors, and on eight cents a day on the average except when guests stayed with them. Augusta was a good cook and knew how to bake. In this way they lived by themselves with their piano, a radio, and a small newspaper, year in and year out. In wintertime they often were snowed in up to the second floor so that for four weeks they were absolutely shut off from the world. These very good friends of mine I used to visit two to four times every year between 1920 and 1939. I was a welcome guest because of the interests we had in common and particularly because good humor never left me when I was with them. I liked to make him laugh because his laughter was as powerful as it was natural. Sometimes we read serious literature or played chess while the piano was played artistically or the radio was on. In any weather during summer or winter we took excursions. Sometimes I got stuck in a snow bank so that I could not get out without his help. First we would laugh like fools and then he would start to dig. He was underweight so it could not happen to him. When I felt overworked, this was my recreation. When Mrs. Meyer had guests in the house I would stay with the Hübners for days or weeks. From Hübner I have now received a letter announcing that they escaped to the Rhine province (British zone) after having been completely plundered of all possessions.

In 1933 Hitler usurped the government by means of frivolous speeches, lies, and fraud. At first, his scandalous and destructive behavior did not concern me very much. In common with most Germans in a secure position, I had never been a politician. We had a government with fair manners and we were content. Why should one be concerned? We were educated in this way and had a king or an emperor who should know what to do and a Reichstag and a Landtag where the twaddlers had to go to see that all was in order. One could mind one's own business or hobby just as I did, and one could read the newspapers and periodicals to know what was going on. But if something was not in order, then it was usually too late.

The only time that I was disturbed by the police was when a policeman came to our home to ask for our passports which he had to take to the Gestapo. He did not know why this was required. After fourteen days I got the order to go to the Gestapo. My wife thought I would end in a concentration camp and I had to promise to call her when the procedure was over. A part of the "Polizei-Praesidium" was reserved for the

Gestapo, locked and segregated from the other parts of a lattice-like affair—a cage for beasts of prey. In the antechamber was a placard: "Don't be excited." They had me sign a receipt that I had received the passes and let me go. Why the incident happened I do not know. I think it was perhaps on account of denunciation by a good friend. The officer put a sheet of paper on which something was written under my nose. I feigned not to be interested.

In January 1934, on the occasion of my seventieth birthday, ninety-nine gynecologists of Germany and Austria, among them all the directors of university gynecological clinics, presented me, through Professor Stoeckel, with my bust made by Fritz Klimsch, one of our best sculptors. The presidents of the German Pathological Society and of the University of Berlin, the first under Hitler, and also a famous authority on races, congratulated me in wonderful letters which I still preserve. The bust I have promised to return to the Universitäts Frauenklinik in Berlin.

At first my position was not attacked, especially because of my moral authority. The leaders among nationalistic physicians sent me, as before, the material from their patients up to the time I left Berlin. Only when, after three years, at the end of 1935, the anti-Semitic group felt strong enough to eliminate every Jewish man from his post was I dismissed —but only officially. Unofficially I remained in my position three years longer to the end of 1938 at the suggestion of Dr. Stoeckel and with support from the Minister of Education. I was allowed to stay on without salary but had permission to keep all the money I earned from private patients without deduction. This amounted to 24,000 marks annually while the salary was only 6,000 marks. The state paid all the expenses for the sake of the institute and I could have been content with this trickery. At the end of the first year my private income amounted to 30,000 marks and increased steadily. At the end of the year 1938 the Minister of Education, Rust, together with the Minister of the Interior, Frick, with whom I had never dealt before, decided that the "German nation as a whole" was now anti-Semitic enough to do without me. Not literally, but that was the essence of it. I answered Stoeckel that the "German nation" did not know me.

During the time the war against Czechoslovakia was in preparation I was on vacation in Altheide, Kudowa, and Reinerz near the German-Czech frontier. It was very peaceful everywhere and none of the shooting

which filled the newspaper reports could be heard. But then, at dinner time, the official loud-speaker reported the latest sudden attacks on innocent Germans and at the end the Deutschland-Lied and the Horst Wessel song resounded. One had to get up and sing it with wild enthusiasm; otherwise one was proved a traitor to the country. Meanwhile the soup got cold.

Stoeckel was touchingly kind and helpful to me. He allowed me to stay in my institute as long and as often as I wished and this was very important to me. I had to prepare for my departure in 1939 by having fifteen hundred diapositives on films made, because they were easy to transport, and I also had to sort out as many slides and paraffin blocks and my pictures. I wrote to my friends and former students in America that I was seventy-five years young and I would like to come if they could provide me with a position. Through the energetic efforts of Dr. J. L. McKelvey I was offered a position at the University of Minnesota.

Meanwhile, I was not idle. I had to run many errands from one official board to another and I had to go especially often to the fiscal office to pay and they cheated me more than absolutely necessary. But with an assured post I received permission to emigrate to the United States without quota, and that was an immense advantage because the time was short before the war broke out—which was to happen in 1939 as the anatomist Brandt in Birmingham had already written me in January of that year. So we were prepared even if Chamberlain was not.

Long before, I had set the date of our departure for the first of September, because I knew how difficult it would be to get a permit to take part of our furniture with us. If I had not had a friend who was a high ranking customs officer, we should have had to travel without our luggage and without any of my scientific material. We were prepared to make the trip to Holland by aeroplane at noon. That morning at seven o'clock a nephew of mine called, "Do you know that we are at war with Poland?" I telephoned to the airport to enquire whether there was a plane flying to Holland and the answer was negative. I called all the railway stations to ask if a train was leaving for the West. One was scheduled to leave in half an hour for Cologne. Now it was high time to pack our small luggage and leave all other things, including a maid and a dog, behind us and within the hour we left Berlin. The poor dog! No man can be so

inexpressively joyful as a dog and no one can be so deeply grieved. It died of grief. Is it not a thousand pities that there should not exist a heaven for their poor souls?

A friend of ours who accompanied us to the station asked me to give her the reservations for the aeroplane for redemption. In my haste I gave her the reservations for the steamer in Rotterdam. We had to spend the night in Cologne and when we arrived in Holland the next morning they asked us for the steamer tickets which I did not have. "Sorry, we must take you back to Germany," they said. "Not alive," I answered coolly. "May I use your telephone?" "Yes." I called a friend in the Hague and found out what it means to be a guest speaker. No one seemed to as possible and have the Holland-American Line call the railway station at the borderline to confirm that I had cabin No. 26. Furthermore I told him he must send us a car because there were no more trains. Meanwhile we ate a Dutch beefsteak since we were each allowed to take ten marks with us of our own personal capital, and after some hours the telephone message came through: "All right." My wife had recovered from the first shock and at midnight we arrived in the Hague. Sunday we could rest and Monday I had to go to Rotterdam to look for our luggage. It had arrived except for the three big cases containing my scientific material. I was introduced by a good friend to the director of the steamship company who promised to notify me by wireless and to send the cases on as soon as they should arrive. The first two days I often said to my wife, "What shall I do in the United States without my material and without knowing English?" After two days the wireless came advising me that the cases were on our steamer. My sigh of relief made the whole ship tremble and I said to Mrs. Meyer, "Now I shall learn English." Really they were on board but only because the steamer had been delayed twelve hours because we had to wait for three hundred Americans who were coming from Paris. The steamer was already crowded. We also had to take on thirty-two men from two English lifeboats which were announced by a German submarine that had torpedoed them and that had given them directions how to meet us. Otherwise the journey was without any incident. In the last days I met Dr. Anspach of Philadelphia and his wife. I knew him from my American visit in 1931. We renewed our friendship and our wives very quickly became good friends.

We arrived in New York in a light morning fog but the grandiose

view was no less fascinating than the first time; on the contrary the fog made it appear unworldly. Dr. Motiloff, a former student of mine who also knew my wife, met us at the pier and helped us through some difficulties. He had arranged a program so we had no trouble. Motiloff had been with me in Berlin for four years and showed his gratitude with a combination of Russian and American hospitality. He was assisted in this by Dr. Grete Stohr, who had also once been with me in Berlin. Now they were both scientific assistants to Dr. George G. Ward in the Woman's Hospital. They had prepared a program for the eight days we stayed in New York; and Brettauer, the Rubins, and the Trauts, my old friends, vied with one another to make our visit as agreeable as possible.

On the 21st of September, 1939, we arrived in Minneapolis and stayed for one week with the McKelveys until we found an apartment. We were welcomed with the utmost amiability and were introduced to many people who later became very good friends. Among them were the Diehls, the Litzenbergs, the LaVakes, the Hartleys, the Moes (Duluth), and our best friends, the Ehrenbergs, to name only a few. Mrs. Meyer especially also made friends here with some ladies, as everywhere. She spoke English quite nicely. She was invited by Mrs. Harold Diehl to meet the wife of the President of the University, Mrs. Ford, and the ladies of the Faculty and was asked, "How do you like America?" Lively as always, she answered, "My God, one gets accustomed to it." Impetuous laughter from the company. We were also very good friends of Dr. Arthur Curtis of Chicago whom we met twice for four weeks in Lutsen on the North Shore and later on I myself, as often as I had to pass through Chicago, was a house guest of his. Sometimes I stayed with Dr. Bacon whose amiable wife was a sister of Dr. von Rosthorn, the gynecologist in Vienna. We also stayed with Dr. Moe in Duluth and his very nice wife. Nor do I forget Dr. and Mrs. Harold Leland, the music lovers.

I had to learn English; my pronunciation was miserable. After two months I was invited to give the two Bacon lectures in Chicago. I accepted in spite of my bad pronunciation. I discussed carcinoma diagnosis and found out what it means to be a guest speaker. No one seemed to realize that I was seventy-five years old. Some weeks later in Rochester, Minnesota, I spoke a little better on the same topic and still better in Detroit, Michigan, where I was invited by my former student and good

friend, Dr. Harold Mack, who with his amiable wife and children gave me a wonderful reception.

I published that lecture in *Surgery, Gynecology and Obstetrics* (July and August 1941). It is possible to make the diagnosis of carcinoma of the cervix when it lies in the surface epithelium without having invaded the underlying connective tissue. This is proven in cases in which the diagnosis of carcinoma is made and which are re-examined three months later. The term "pre-cancer" should not be applied in practical work. It is dangerous. The histological diagnosis is easy to teach and to learn. This work is, in my opinion, a step forward since the diagnosis is based on clinical and histological experience in thousands of cases.

In Indianapolis I had to give a lecture at the invitation of the Central Association of Obstetricians and Gynecologists. I spoke on the pathology of Mola hydatiformis and Chorionepithelioma malignum, a topic which had been dealt with in the German handbooks and which was found to be too voluminous for publication, as I mentioned above. This refusal in America was the first in my life, because in Germany one judges the value of a work by other principles.

I must interrupt my report of successes and failures. The greatest misfortune that could strike me happened at this time. I lost my wife. She was the best I could find in the whole world. After fifty-two years of happy marriage I said to her, "Now we have been happily married for two years." She asked why only two years? "Ah, the first fifty don't count," I replied, and she smiled indulgently. Soon afterward, on the 8th of December, 1941, she died at the age of seventy-five. I have been a little lost since. We had so much in common, the love of music and all the arts. She, too, had a good sense of humor and the sense for a good kitchen. We read together all the best literature of France during the nineteenth century, some of the English, some of the Scandinavian, and especially the great Russian literature in German translation. We read Gabriele d'Annunzio and the Swiss writers, Conrad Ferdinand Meyer and Gottfried Keller, not to forget the unimportant but amiable "Maikäferkomödie" by the Swiss author Widmann, a friend of Brahms. We read German literature, especially Friedrich Nietzsche, the plays of Gerhard Hauptmann, the novels of Fontane and Wassermann and many others who had good names. But we also read many a fly-by-night. We finally had a large library, of which we could rescue only the classics, like Goethe, Schiller,

Heine, Kleist, and Hölderlin among others, to whom we always returned.* Among modern painters we loved only Böcklin, Liebermann, Menzel, Laibl, Corinth, and a few from other countries who appeared from time to time.

Our interest in music never abated. We heard as many concerts as operas and listened to many brilliant conductors. Among soloists, every artist of distinction was familiar to us. I will not enumerate what we heard but only mention that we listened to all of Brahms' chamber music performed by the "Bohemian String Quartet" with piano accompaniment by Eugen d'Albert in a series of concerts. We saw many good actors like Sarah Bernhardt, Eleanora Duse, Sonnenthal, and Kain, the latter quite often. We studied together all the songs of Brahms which were generally unknown in 1890, although some singers like Hermine Spiess were endeavoring to make them popular. My wife had a wonderful voice and had had instruction to become an opera singer and also had a natural art of recitation so that the well-known Theodor Lobe would have engaged her at once. She preferred, however, her place as a doctor's wife in a country place. Her personality with the warmth that shone from her eyes charmed anyone who roused her interest. She had another advantage over me—she was an excellent judge of people and foretold events which I thought at the time to be impossible and which, to my deep regret, came true years later. Her fatal illness was lightened by the loving care of her friends, chief of whom were Mrs. Claude Ehrenberg and Mrs. John McKelvey. Her crowning joy was to see once more her bosom friend, the warm hearted Mrs. William Horne who hastened from Chicago to her deathbed.

The following year I was invited by my good friend, Dr. Terplan, an Austrian pathologist who had been many years in Buffalo, to speak before the Academy of Medicine. Terplan is especially known for his work in tuberculosis. I was very happy to stay with him and his wife and four sons and to revive our old friendship. I spoke about nerve tumors in the female genitalia and pelvis and published this paper in the *Archives of Pathology* (36 [1943]). This paper presents a simplified classification of the nerve cells and consequently of nerve tumors. The main hindrance

* Is it not curious that we count among so-called world literature Dante (Italy), Cervantes (Spain), Shakespeare (England), and Goethe (Germany), but not one of the French writers who produced so many great works and none equal to the others.

to a clear understanding was caused by the incongruity in the definition of the various cells. One speaks of sympathogonia and sympathoblasts to designate the first cells in the development of the sympathetic nerve system, while in that of the cerebrospinal system there are known only neuroblasts. The term "gonias," meaning the first cells of the sympathicus, has no equivalent in the cerebrospinal system and is taken not from the normal development but from the pathology of the tumors. Therefore I proposed calling cells of equal capabilities in both the central and sympathetic nervous systems by the same names and the tumors also. I identify "blasts" as indifferent elements capable of differentiation in at least two different lines and call only such tumors "neuroblastoma"; on the other hand, I call the tumors composed by differentiated ganglion cells "gangliocytomas," by neurofibrils "neuroma," and by Schwann sheath cells "neurinomas." Added to the tumors of the cerebrospinal system are the gliomas arising from the cells homologous to Schwann cells. Added to the sympathetic nerve cell tumors are the "phaeochromocytoma," of which one does not know for certain whether they belong to the nerve cells or not, but they arise from the same region and are similar to the neurocytes. Tumors which contain mixtures of the above may be designated by a composite of names; for instance, ganglio cytoneuroma, of which I have described a case in the hilus ovarii. It is striking that these tumors do not occur more often in the ligaments in view of the presence of the many paravaginal and parauterine ganglions. Pelvic gangliocytoneuromas occur retroperitoneally in the pelvis of young persons. Ganglion cells are only found singly and may get choked by the proliferation of fibrils, so that a neuroma could occur without ganglion cells. To approximately twenty cases in the literature I added three cases of my own. Neuromas occur in the female pelvis closely related to von Recklinghausen's disease as "plexiform and tendrillar neuroma."

Sympathoblastoma seems to be extremely rare. A single case of "gangliocytoma" had been reported as being attached to the coccyx. The main part of the tumor was composed of so-called "sympathogonia and sympathoblasts," *i.e.,* in my classification more or less ripe "sympathoblasts." I have given special consideration to the neurinoma, which is characterized by a special structure, the so-called "rhythmical" structure of cell palisades. This tumor occurs very seldom in the ovary, the pelvis, and broad ligament and paravaginal regions, but mostly in the uterus.

I have seen this tumor in four cases, of which one was malignant. A similar rhythmical structure occurs in myoma and sarcoma of the uterus by regression. It is due to accumulation of fluid between the elongated fibrils which arise from the two poles of the cells. The young neurinoma does not present the rhythmical structure. I have critically evaluated the literature and I have suggested correction of the diagnosis in some cases. The pictures I have given are cut down too much and reproduced in an unfavorable way, as occurs so frequently in American literature. I do not know why that has to be. If the editors would pay as much attention to the pictures as to the text, it would be ideal.

In the Minnesota State Society of Gynecologists I had to speak about the "Anovulatory Cycle and Menstruation." This lecture appeared in the *American Journal of Obstetrics and Gynecology* (January 1946). It is an old quarrel between the biologists and the gynecologists as to whether or not it is permissible to call the anovulatory bleeding menstruation. When I made it quite clear in earlier years that I understood by the term menstruation only that bleeding which follows the progestational phase, I condensed my opinion in the phrase "without corpus luteum, no menstruation." The anovulatory "menstruation" was based on the fact that there occurred also a necrosis to a lesser degree caused by ischemia similar to real menstruation. Everybody repeated the opinion of the biologists that I was wrong. To make it clear, I changed that incriminating phrase to "without corpus luteum, no progestational phase, without which no true menstruation." The similarities of the ischemic necrosis in the anovulatory cycle with true menstruation after the progestational stage are superficial. The preparations for pregnancy in the primates differ from those in the lower animals because they must be prepared for a different type of placentation. One cannot relate estrous bleeding to menstruation. The gynecologist considers the problem from another angle than the biologist. He has to consider fertility or sterility; these are the fundamentals of all life. If the biologist calls the "anovulatory cycle" a menstruation, the gynecologist cannot follow him. He has to think in terms of ultimate ends.

In my English publications I am indebted to Dr. John McKelvey for his excellent work in translating my German-English into his good Canadian English during these years. He is especially gifted because of his quick perceptive faculty.

Concerning the "Development of the Vagina," I spoke first before

the Travel Club of the Central Association of Obstetricians and Gynecologists; later, at the New York Society of Obstetricians, and in Baltimore as well. There I found an excellent audience. George Corner and George Streeter of the Carnegie Institute of Embryology spoke in the discussion and so did Emil Novak. Later I read the paper before the Anatomical Seminar of the University of Minnesota, where the President, Dr. Boyden, and his assistant, Dr. Wells, discussed the paper. At the meeting I also discussed the pathology and showed some pictures.

Whether or not the Müllerian epithelium can change to squamous epithelium is not yet known. Multilayering is not to be interpreted as squamous epithelium. Its presence in the lining of a unilateral hematocolpos always raises the question of the possibility of some connection with the other and open half of the vagina. I also presented cysts of the hymen with mucous epithelium, which are much more frequently found in older fetuses than in children and adults. Among others, these are also found retrohymenally and retrovaginally, both inside and outside the wall proper.

Cysts of the Müllerian ducts usually appear in the midline of the posterior vaginal wall. This has been demonstrated in older fetuses and in the newborn. Relatively large portions of the Müllerian vagina may become separated and form short or occasionally long diverticula of the posterior wall and shorter diverticula of the anterior vaginal wall. In the case demonstrated, the Müllerian epithelium persists only in the upper portions of the diverticulum. There is sufficient of this to warrant the conclusion that it would likely have given rise to great mucinous cysts.

Where Müllerian epithelium is aberrant, it may remain simple and unilayered but may also ripen to mucous epithelium. It is now clear that this can give rise to primary adenoma and adenocarcinoma in the vagina which was formerly not understood and therefore denied. A case is demonstrated which shows a papillary adenoma of the posterior fornix, mistakenly ascribed to "aberrant cervical glands." This case is complicated by a primary squamous cell carcinoma in the fornix similar to that which occurs in the cervix.

The differential diagnosis between cysts and glands of the Müllerian duct and those of the paraurethral ducts and the "female prostate" is discussed.

The vagina thus shows many individual variations and transitions to pathological development with clinical pathological consequences in post-fetal life. This would seem to justify a consideration by gynecologists and pathologists of the normal development of the vagina and its relationship to these abnormalities.

Recently I gave a lecture on "Contribution to the History of Cancer Diagnosis in Germany," before the Travel Club of the Central Association of Obstetricians and Gynecologists. This paper is a short history of some human errors in science and of slow but steady progress in diagnosis of cancer until the "general pathologists" introduced the examination of pathologists in the practical field of diagnosis. The lecture was given at the

invitation of their president, Dr. Claude Ehrenberg, a very good friend of mine, and was dedicated as an address to that Society, which had nominated me as its first honorary member.

My last work concerns the "Normal and Abnormal Development of the Ureter, a Mechanistic View." *(Anat. Record,* 1946). It claims to explain the otherwise not understandable complex movement of the ureter as a repulsion from the Wolffian duct and gives for this mechanical power effecting movements during development some other examples similar to those given some decades ago by R. Beneke. Differentiation means alienation with repulsion. The attraction, on the contrary, means the growing together of similar tissues. The summary of this follows:

I. The development of the ureter is a coherent totality induced by a single continuous impulse physically considered as an active reciprocal repulsion between the ureter and the Wolffian duct during the continuous differentiation synonymous with alienation. The progressive specialization acquired by the phylogeny, causally not accessible, is responsible for the strange course of the ureter during development. The inherent tendency of the ureter to become independent of the Wolffian duct is satisfied by the deliverance to the bladder and the further removal from one another. This is made possible by the local reversion of the orifices including the Wolffian pit and the trigonum anlage. By these means, the Wolffian ducts do not ejaculate the semen into the urine, and the Müllerian vagina between the Wolffian ducts opens to the outside in the vestibulum. The ureter always starts from the knee of the Wolffian duct between the longitudinal and the ventrally bent part.

II. Anomalies: A complete trigonum contradicts the supposition of an ectopic ureteral orifice but suggests the occlusion of the ureter if an orifice is missing. The ectopy of the ureteral orifice is caused by inadequate differentiation or alienation from the Wolffian duct and by the dilatation of the common end of both ducts not reaching far enough cranially. This can happen when the ureter starts from the Wolffian duct uncommonly high, dependent on the caudal curve of the embryo influencing the site of the "knee." The development of the ureter two months earlier does not hinder the eventual development of the seminal vesicle at the same place. It is the Wolffian duct which reveals its latent quality of forming a ureter also at higher places normally reserved for other anlage, *i.e.,* a qualitative pluripotency.

How I worked should be of interest to my colleagues. I got up on the average at five o'clock. I read, without exception, every publication that appeared in my field in the international literature; I followed developments in anatomy, in biology and pathology, and in related fields and made abstracts of what I read, no matter whether these publications would be of immediate advantage for my studies or might be so later on perhaps, or not at all. When I left Berlin, I had to destroy thousands of excerpts. Many others I brought along which I can never use.

I also have regularly made a large number of abstracts of works in allied fields in four languages for many years for Frommel's *Jahresberichte* and later for the *Berichte* of Gynecology and Obstetrics. On the occasion of my seventieth birthday, in the presence of the editor of the *Berichte,* Dr. Ferdinand Springer, in answering the addresses I admonished the younger men not to neglect the good habit of making abstracts of works in German and any other languages when they come into positions with responsibility, because making good abstracts affords a great experience and helps one to read with attention. The abstract must be so clear that the author can learn from it what he would have liked to write. This little exaggeration one may pardon, since I continued to make abstracts even after I was past seventy years.

When I had an idea which did not leave me, I pursued it. When it lasted five years or more, as in the case of the development of the vagina, I felt, for one or two years, a dark presentiment of the possibility of a solution, for fancy and criticism must work together and against one another in order to be productive.

I was often forced to write down what I thought in order to have something on hand. What I had written I did not forget; but as long as I kept it only in my head it did not take shape rigidly enough to be kept in mind. That applies to most of my larger works. I was not able to write a work from beginning to end but had to write down what I thought and, in writing it down, I had new ideas or criticisms which I also had to write down. All this I brought into a special order and then conceived the work as a whole. But not a single work has been written at once in good order. I had to rewrite again and again three or four times to make myself clear.

I once read in *Science* that one should write so that a misunderstanding is impossible. Unfortunately that is not practicable because the reader does not always read correctly; otherwise it would not happen that one is so frequently misquoted. The reader should have a feeling of responsibility towards the writer. American editors, especially those in the natural sciences, but also in medicine are reputed to be very severe in regard to grammar, idiom, and brevity. Some of them believe themselves to be authorities. I have been myself the co-editor of the famous *Archiv für Gynäkologie* from 1931 to 1938 and for Volume VII of the Handbook of Pathology (Henke-Lubarsch). We have never taken notice of trifles except

for misunderstandings or erroneous quotations. When the content of a work is good, let everyone speak his personal language. Everybody knows that in a hundred years the language will have changed by evolution, so why try to make it uniform? The language of a person betrays his character and this often is most important. The language of everyone is personally learned in school and in the home. What you believe should be your own concern and should be standard. All this is but your habit of speech; and how can you imagine that anyone should be interested in your habits? But it is true that the average American student is not a writer. Send their manuscripts back to them when they are ungrammatical and illogical, and when they quote wrongly or second-hand. But do not try to standardize the compositions in schematic patterns. Nothing is more tedious for the reader than schematism. Train them and make them learn more and better in high schools and undergraduate years. In a hundred years we know that not only the language will change but also the kind of thinking dependent on experience and general conceptions.

What did I do for my time? We always live in a transitional stage. Sometimes it is revolutionary, sometimes impetuous, when a hero like Virchow, or Pasteur, or Koch marks a new era; but mostly gradually, when many less important men under the leadership of single persons work purposefully in a new direction, as in modern biology. Youth is inclined to follow the leaders because youth is revolutionary. Thus, it happens very often that a field of science is neglected before it is thoroughly plumbed. Look, for instance, at the programs of an anatomical meeting or the Wistar abstracts and try to find some anatomical work or an embryological one. I have lived in a time between a merely morphological pathology and a biological one. I followed the change of the times actively in using the morphology for functional studies with remarkable success. Why did I not change the method of research? Was I not young enough? No, it was because I believed that the morphology was inexhaustible and that my talents were more on the visible side of science. In both points I have been right.

But what did I do for my time? I have always had the idea that I should improve the logic in my field and the consciousness of my readers so that they might be a little more reserved in their judgments. The personal influence of a man on his time nobody can judge as well as himself, especially in observing that many misinterpretations, wrong diagnoses,

insignificant catchwords and theories silently disappear from the literature. Finally, I believe I have made my readers reflect more, at least to a certain degree. It is not necessary that they avow this especially. Also I have introduced into my special field, in Germany and other countries, a whole generation of scholars who are doing their best to work in that line of endeavor. It is not necessary to be quoted always: the best of my designations have never been contested, and are no longer quoted with my name.

In recent times one of my scholars showed me a paper in an American journal and was quite excited not to find my name quoted, although it was I who first described the particular condition. I consoled him by saying, "My good friend, it is indeed my greatest success when my opinion is quoted without my name. It proves to me that my conception was right. Not the fact that I was right. The important factor in our life is how we influence other people to think."

There may be many people who would like to hear more of my personal life instead of my work, but there is not much to tell. My whole life has been dedicated to my work. I have always been interested in some questions, whether or not they were remote and of interest to few men. It is essential for every worker that he over-estimate the importance of his problems. This I have done indeed, and do it to this day when I think I have to say something. I have always had the greatest pleasure in thinking and in making myself understood, and many people did understand. A life based on thinking and intellect is not a gratification fallen from heaven into your lap, but the result of learning and training to the utmost. A casual worker is successful only when he is a genius. No doubt it did happen that I did not find the right expression for some of my thoughts. But one of our leading men in Pathology, Professor Hueck (Leipzig), in giving a review of my volume in Lubarsch-Henke Handbook of Pathology, stressed my language as well chosen.

Next to my science, I had the gift of reveling in good music, fine literature and arts, and an almost religious appreciation of Nature—but this alone for myself. I was able to travel in the mountains three to five times every year at the time of the inflation. I was independent and had to ask no favors and did not take the political events and my personal losses too seriously. I was a healthy man and what that means nobody can judge better than a man who has to consider his body. I was happily mar-

ried and always had good friends. Am I not right to say I would like to live my life again?

Very early in my life I was called an authority in my field. To call men authorities is dangerous for some believe it of themselves. Virchow said that the scientist should be recognized as an authority of experience but not of judgment. I cannot agree to this differentiation since, as I stated above, observation is influenced by theory or, what is equivalent, experience by judgment. Whether one has keen judgment or not depends primarily on the inherited anlage of the brain. Many people judge by fancy without criticism. Thus many people are in the habit of misjudging. Many scientists show that experience is of great value, when they try to judge things outside their own fields. Sound horse-sense is more valuable than anything else. Authorities are rare, but he who is considered as one has a tremendous responsibility to science.

I once said, about 1910, to my student, Aschheim, who spoke of "competition": "I do not know competitors but only collaborators." In earlier years I was said to be unnecessarily critical. I have sometimes offended my adversary but only because I thought I was right. I did not always realize that one might comprehend things from different points of view but thought one could not see things in any other way than as I conceived them. I allude to general questions of thinking. Who tells us that we are right? Is something correct only because we think so? Since I saw that everybody believed things for himself—the blockhead as well as the shrewd—I became very critical of myself and especially since I saw that my judgment was not infallible. Who does not know a person who is not clever at all but thinks he is, persons who are parrots and believe what they think must be correct and original, of course, otherwise they would not think it. Every barber can do that, but not a scientist. When by chance such a person arrives at a good position he becomes intolerably arrogant and will never recognize his short-sightedness and dependency. To be taken for a blockhead by such a man is part of the sublime enjoyment of the gourmet, says a French author. Whether we are clever and judicious or not, we must depend upon the verdict of experts in our field and not on our own judgment. And when the time is not ripe for our thoughts the future will decide it. This consolation the imbecile and the genius have in common.

My own friends take me for a very modest person, or even too

modest, but in my very heart I am still more modest, knowing that there exists a chasm that one cannot span. Measuring my own work with that of greater men, I took to heart the modest words of a French philosopher, "Ce que sais je le sais fort mal mais ce que j'ignore j'ignore parfaitement." (What I know I do not know for sure but wherever I am ignorant my ignorance is perfect.)

Since December 14, 1945, I have been a proud citizen of the United States of America.

Notes and Queries

Edited by RALPH H. MAJOR*

The Chinese Journal of Medical History

The year 1947 saw the appearance of the *Chinese Journal of Medical History,* the official organ of the Chinese Medical History Society. The *Journal* is published quarterly, and the first two numbers (January-March and April-June) have recently been received. An Editorial Board consisting of Y. H. Yu, Editor, K. C. Wong, Managing Editor, H. C. Fan, B. E. Read, and Lee Tao is in charge of the *Journal.*

The first number appeared on the tenth anniversary of the first conference of the Chinese Medical History Society held in 1937 at Shanghai. Among the articles in the first issue are the following: "Chinese Materia Medica, A Review of Some of the Work of the Last Decade," by B. E. Read (in English); "Chronology of the Medical History Movement in China," by K. C. Wong (in English). Other contributions (in Chinese) are: "Early History of Medical Contacts between Russia and China," by Y. J. Ou; "Wu Shau-hsien, a Pioneer of Surgery," by C. T. Keng and C. C. Yeh; "Some Physicians of the Last Years of the Ming Dynasty," by C. K. Chang; "Chinese Medical History," by H. C. Fan; and "Researches on Chinese Spurious Medical Works," by C. M. Hsieh. Unfortunately these papers do not have abstracts in English.

The second number of the *Journal* presents the following contributions (with abstracts in English): "Historical Notes and Comments on the Diagnosis and Treatment of Hydrophobia in China," by Y. Ch. Lieou; "The Yin Yang Principle of Su Wen and Chinese Medicine," by P. H. Chen; "Chinese Medical History," by H. C. Fan; and "Synonyms of Indigenous Drugs," by L. C. Wang. There is also a report on the Second Medical History Conference at Nanking.

It is with considerable pleasure that we greet this enterprise of the Chinese Medical History Society, and we wish the new *Journal* a long and distinguished career.

GEORGE ROSEN

A Medical Chronogram

The interesting note by Miss Jeanette Beebe in the *Journal of the History of Medicine* (1947, *2,* 386-388) deserves to be supplemented by recalling a chronogram in an English medical book of the seventeenth century.

James Wolveridge's *Speculum matricis* has been described more than once,[1] but as a few more copies of this very scarce work have been discovered

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[1] Essen-Möller, *Irish J. med. Sci.,* July 1932, 312-314, with reproduction of 1670 title-page; E. F. Kiser, *Amer.J.Surg.,* 1936, *32,* 188-192, with reproduction of 1671 title-page; T. P. C. Kirkpatrick, *Irish J. med. Sci.,* August 1938, 577-578; and earlier references quoted in these papers.

of late, their locations are worth recording, and this may perhaps lead to the finding of other copies. It is one of the earliest English midwifery books and the work of an Anglo-Irish practitioner, the preface being dated "From my Study in *Cork,* Jan. 12, $16\frac{69}{70}$." The *Speculum* appeared in two issues, identical save for the title-pages on each of which the same chronogram appears.

1. Speculum Matricis Hybernicum, or the Irish midwives handmaid . . . by James Wolveridge M.D. . . . written IVXta MagnaLIa deI sCrIptor, Anno Domini, 1669 – Chronogramma, 1669 – London, E. Okes for Rowland Reynolds 1670.

The capital letters in the chronogram may be re-arranged to form the date 1669 (MDCLXVIII).

Three copies of this issue have been recorded: Bodleian Library, Oxford; Hunterian Library, Glasgow; Dr. E. Essen-Möller, Lund, Sweden, destined for Lund University Library.

2. Speculum matricis, or the expert midwives handmaid—London [as previous issue], 1671.

Six copies recorded: Dr. T. P. C. Kirkpatrick, Dublin; Dr. E. F. Kiser, Indianapolis; Manchester Medical Library; Royal College of Physicians of Edinburgh; Royal College of Surgeons of England (2 copies, each defective but together containing the whole work).

Wolveridge appears to have had a taste for verbal tricks, since besides the chronogram his book contains among the commendatory verses an acrostic on his name, at leaf a6*a*:

To my most Worthy Friend,
Dr. James Wolveridge,
upon his Book Speculum Matricis.

If I were skill'd in Chaldaick, or in Syriack,
As others, who might well thy Praises shew;
My muse would then compell a Panegryrick
Even for the debt which to thy worth I owe;
Sith I to that could never yet attain,
Which makes thee famous in the Art of Physick,
Or imitate thy Great Heroick strain,
Lo, I begin to try in tones of Lyrick.
Let Grave Physitians greet thee with a kiss,
Unskilful Quacks may hence learn to amend
Expell their poisons, which for want of this
Rent many a heart, and brought untimely end:
I mean, because they knew not man's first being,
Do still mistake; I say't cannot be fit
Giving Remedies which no way are 'greeing
Express mens ruine by prescribing it.

Your Obliged Friend,
Richard Sampson

W. R. LEFANU

Royal College of Surgeons of England,
Lincoln's Inn Fields, London, W. C. 2.

QUERY No. 12. Whence the name il Bo?

The visitor to Padua is invariably intrigued when he learns that the main building of the famous university is called il Bo, the local dialect for *Bove* or ox. Hastings Rashdall,[2] in recounting the history of the University of Padua, states, "the ox-tax and the waggon-tax were assigned for the payment of the Doctors." In a footnote he adds, "Hence no doubt the name of the University building il Bo." Tomasini,[3] whom he quotes as authority, writes, "that the stipends to the professors should not fail, the Carraras assigned to the college (gymnasium) in perpetuity the tax on carts with iron rims and without iron, likewise on oxen."

Some years ago a student at Padua told me that the university building stood on the site of an old inn called il Bo, or the Sign of the Bull, and the name of the university building was derived from that of the inn. Professor Castiglioni writes, "It is quite right that the name Bo was originally the name of an inn on the place on which the University was erected." Further than this, Professor Castiglioni does not commit himself.

Can anyone throw additional light on this subject?

RALPH H. MAJOR

Another Medical Report Belonging to Ebubekir Razi[4]

There is in Chapter 26 (p. 131) of the Kitabül Ezkiya written by Ebülfereç Abdulrahman bin Aliyülcevzi a part called "Fi Zikri tarafi min fitanil mütetabibin,"[5] a medical observation related by Mehmet bin Aliyyül Emin. The case had been treated by Ebubekir Razi in the following manner:

Physicians of confidence have related to us the following case: One day, a child from Bagdad came to (Rey). On the way he began to vomit blood. Ebubekir Razi, a physician of great fame, was consulted. The child related in detail all that had happened to him. Razi examined his pulse; he analysed his urine, and although he acquired the necessary knowledge about his general state, he could not find any symptom of tumor or ulcer. Thus he could not tell the diagnosis of the illness. He put the patient under observation for some time. The patient was very sorry that a physician of such value could not discover the reason of his illness. Razi thought for some time. He saw the patient again and asked about the water that he had drunk.

The patient said that he had drunk water coming from cisterns and leaking from roofs. Upon this, Razi intelligently understood that there was a leech in the water he had drunk and that the blood coming from his stomach was a result of this. He said to the patient: "I will cure you tomorrow. But for this you must order your slaves to do anything I tell them to." He filled two containers with water-moss, and the next day, showing them to the patient, he said: "You must swallow all the moss found in these containers."

The patient swallowed some and stopped. He said he could not swallow any more. Then Razi gave orders to the slaves. These put the patient down on his back and opened his mouth. Razi forced the moss down the throat of the patient and began to frighten him

[2] Hastings Rashdall, *The Universities of Europe in the Middle Ages*. Oxford: Clarendon Press, 1895, Vol. II, Part I, p. 20.

[3] Jacob Philippi Tomasini, *Gymnasium Patavinum*. Utino: Schiratte, 1654, p. 17.

[4] Rhazes (Abú Bakr Muhammad ibn Zakariyyá al-Rází, 850-923).

[5] This work appeared in Egypt in 1304 at the Elmatbaatül Amiretül Masrikkiye. This copy was called to our attention by Dr. Rescher and was translated into Turkish by Professor Necati Lugal of the Faculty of History of Ankara.

so that he would swallow it all. He told him he would beat him if he did not swallow. In this manner, he made him swallow all the moss found in one of the containers. During this time, the patient screamed and thought he would die. Razi took no notice of this and continued to force the moss down his throat. At last the patient began to vomit. Razi then examined the moss that came out and saw that there was a leech in it. The leech had been caught in the moss that the patient had swallowed. Thus the patient was saved and was immediately cured.

The report was ended here.[6]

Ebülfereç had heard this from Mehmet bin Aliyyül Emin, who had heard it from someone else. According to the narrator, it is very probable that this report belongs to Ebubekir Razi; nevertheless, there is no possibility of comparison, as no such treatment for swallowed leech is to be found in his books. But although no such knowledge exists in his books, it is not to be doubted that this belongs to Ebubekir Razi. Classical knowledge which enters books is something different from reports about therapeutic methods. Part of these are related by word of mouth but do not enter books. There are times when rare cases are said to belong to noteworthy physicians to attract attention. But this is not the case in this instance because there are eleven more case reports which follow this one, and most of them belong to old physicians known to us all. The most important point of this report, which we are not going to analyse here, is that Ebubekir Razi, not being able to diagnose the illness at first sight, took the patient under observation. This is a good example of the strong clinical view for which he was often praised. While the patient was under observation, Razi questioned him very closely. At last, seeing that what he suspected seemed to be true, he used a treatment worthy of his time and, according to what is told, saved the patient.

The knowledge which is found in works like Uyunül' Enba fi Tabakatül'-Etibbafrom Ibni Ebü Usaybiyye and which deals with the professional life of physicians is often unsatisfactory. This work has been the source of all the books on the history of medicine, and the knowledge which it contains has been reproduced in new books. According to what we have learned, Ebubekir Razi worked in hospitals as a physician. We find him at the head of the hospitals which he had founded in Bagdad, Bimaristan, and Rey. He did practical teaching at the bedside. Omitting the detail, this is all we know about the professional side of his life. It is only in this work that we find one of his most important medical case reports.

There are many writings about case reports of the ancient great physicians. There are, for example, four case reports in the work of Nizamii Aruzi from Semerkand, called "Çihar Makale."[7]

The last of the four stories found in this work relates the treatment by Razi of a chronic disease from which an Emir of the Semanis, Mansur bin Nuh bin Nasr, was suffering. But according to Mehmet Kazvini who wrote

[6] [For another account of this incident, see Edward G. Browne's *Arabian Medicine* (Cambridge, Eng., 1921), pp. 74-75. *Ed.*]

[7] See A. Süheyl Ünver, "Tip Ilmi ve Meshur Hekimlerin Mahareti" (The science of medicine and the ability of the renowned physicians).

about the Çihar Makale in the Gibb collection at Leiden, this story is entirely fabricated, for Emir Bin Mansur bin Nuh does not belong to the same epoch as Ebubekir Razi. He thinks that there must be a mistake in the name. It is said that this story is related to Ebubekir Razi; but we do not know to what degree this is true. Here again is an example of the fact that certain treatments are said to belong to ancient great physicians to give them a greater importance.

University of Istanbul A. Süheyl Ünver

Black Death

This popular name for the great oriental pestilence which raged over the whole of Europe in the middle of the fourteenth century is not particularly old. In order to distinguish this epidemic from the following lesser epidemics of the plague, it received in most countries soon after its outbreak the supplementary title of "the great" both in the old annals and in the medical literature of that time: *mortalitas magna*. Norwegian documents in the years that followed called it the *stori manndauðinn* (the great death of man), in Sweden it received the name *stordöden or digerdöden*, in Denmark *den store Død* or *den store Mandekval* (the great agony of man), in Finland *iso rutto*, in Germany *Grosses Sterben*, in Italy *mortilega grande*, and so forth.

Black Death or a name synonymous with it was not known in the literature of the Middle Ages. Such a word seems to have come into common speech in the northern countries where it was used extensively in Norway and accompanied here the numerous popular traditions from the time of the great pest, refreshed in peoples' minds by the later epidemics of pest towards the close of the Middle Ages. We first come across the adjective of color, "black," for this epidemic in a Latin verse which was intended to indicate the date when the pest raged. Such "munkevers," as they were called (monks' verses), have been known in differing versions in all the Nordic lands, but only in Norway and Denmark is the adjective of color found—*mors atra*—while the verse in other countries has *mala* or *maxima* or *mors prima*. Because these verses are written in the Catholic period, they may be expected to belong to about 1500 or earlier. Afterwards the name for the disease became known in Nordic Literature, in Sweden (1555) as *swarta döden*, in Denmark (1601) as *den sorte Død:* "That year there was a great pestilence, called the black or the cruel Death."

When the great plague came to Europe in the middle of the fourteenth century, it did not reach Iceland which received its first epidemic of this kind in 1402. This is mentioned in an Icelandic book of travel from 1771 and called *svarti dauði* (Black Death).[8] The book was translated into German two years afterwards and in this way the name *der schwarze Tod* first came to Germany.[9] In the same year Kurt Sprengel in his *Beiträge zur Geschichte der Medicin* used this name as the ordinary expression for the great plague. When J. F. C. Hecker wrote his monograph *Der schwarze Tod* in 1832 and the book was

[8] E. Olafsen and B. Povelsen, *Reise gjennem Island*. Copenhagen, 1772.

[9] German edition, Leipzig, 1774, I, 140.

translated into English the year after, *the black death* came into English medical books although the word had been mentioned ten years earlier in an historical writing.[10] The Netherlands got the name *de swaarte dood* from Denmark with Pontanus' *Rerum Danicarum historia libris X* which was printed at Amsterdam in 1631.[11] From Germany the name found its way to France as *la morte bleue* or *la peste noire,* and to Russia as *chornaya smert.*

In connection with the reason for the color black in the name of the disease James Murray writes in his dictionary: "The epithet 'black' is of uncertain origin and not known to be contemporary anywhere." But even the unprofessional man has long been clear over this. It is not black as the color of death which is meant here, but the symptoms of the disease. Pontanus has written in his abovementioned work: *vulgo ab effectu atrem mortem vocitabant.* Earlier it was said in the Swedish districts that those stricken with the plague quickly got a black complexion (cyanosis).[12] But many other symptoms are equally obvious: black spots after bleeding under the skin over the whole body, gangrene in the plague spots, and sometimes also blackcolored vomit, black urine, and black fæces.

Uranienborgveien 11c, Oslo I. REICHBORN-KJENNERUD

Catalogue of the Mütter Museum of the College of Physicians of Philadelphia

For almost one hundred years the Mütter Museum of the College of Physicians of Philadelphia "has existed with no published catalogue of its thousands of specimens." Now, in the June issue of the *Transactions and Studies* of the College of Physicians of Philadelphia, Part I of a brief catalogue has appeared.

This museum contains more than 7,300 specimens—specimens showing enormous skeletons at various ages, a number of specimens of prehistoric men, and specimens illustrating the various races of Asia and Africa. The richness of this museum and its specimens is impressive even if one glances but cursorily at this catalogue.

RALPH H. MAJOR

QUERY No. 13. Does the inaugural thesis of Caleb B. Matthews on ether inhalation (1824) exist in printed form?

In November 1946 an enquiry was received from Dr. Barbara Duncum, author of the scholarly *The Development of Inhalation Anaesthesia* (London 1947), about an inaugural thesis published in Philadelphia in 1824 by one Caleb B. Matthews on *Ether Inhalation.* At the time we were unable to discover any trace of the thesis, and Mr. McDaniel had no record of it at the Col-

[10] James Murray, *A New English Dictionary on Historical Principles,* III, 73.

[11] VII, 476. Pontanus, "royal historiographer," grew up in Denmark as the son of a Dutch emigrant from Holland.

[12] *Cf.* B. M. Lersch, *Geschichte der Volksseuchen.* Berlin, 1896, 143 pp.: *facies rubicunda nigrescit* (p. 109).

lege of Physicians in Philadelphia. It was assumed that the thesis might not have been published.

The eminent Danish anaesthetist, Dr. Trier-Mórch, has drawn our attention to a listing of the thesis in the bibliography of A. C. P. Callisen's *Medicinisches Schriftsteller-Lexicon,* Vol. 12, page 324, which records the thesis as follows:

989. MATTHEWS (Caleb B. . . .), zu . . . Med. Dr. Philad. d. 4. Apr. 1824; geb. in Virginien.

2031. An inaug. diss. *on ether inhalation.* Philadelphia, 1824.

If any library has a copy of this thesis, its loan or photostats of its pages will be warmly appreciated at the Historical Library, Yale University School of Medicine, 333 Cedar Street, New Haven 11, Connecticut.

JOHN F. FULTON

Swiney Prize for a Work on Medical Jurisprudence
Royal Society of Arts
John Adams Street, Adelphi, London, W. C. 2

The Council gives notice that the next award of the Swiney Prize will be made in January, 1949, the one-hundred-and-fifth anniversary of the testator's death. Dr. Swiney died in 1844, and in his will he left a sum of money to the Royal Society of Arts for the purpose of presenting a prize, on every fifth anniversary of his death, to the author of the best published work on Jurisprudence. The prize is a cup, in normal times of the value of £100, but on this occasion of the value of £150, and money to the value of £100.

The award is made by a joint Committee of the Royal Society of Arts and the Royal College of Physicians, which appoints special adjudicators.

The prize is offered alternately for Medical and General Jurisprudence, but if at any time the Committee is unable to find a work of sufficient merit in the class whose turn it is to receive the award, it is at liberty to recommend a book belonging to the other class. On the last occasion of the award (1944) the prize was awarded for General Jurisprudence. It will, therefore, be offered on the present occasion for Medical Jurisprudence.

Any person desiring to submit a work in competition, or to recommend any work for the consideration of the Judges, should send it to the Secretary of the Society not later than November 30, 1948.

Book Reviews

BARBARA M. DUNCUM. *The Development of Inhalation Anaesthesia with Special Reference to the Years 1846-1900.* London: Oxford University Press, 1947. xvi + 640 pp. $12.00.

DR. DUNCUM'S study is the second in a series of monographs in the field of historical medicine issued for the Wellcome Historical Medical Museum. The first, Singer and Rabin's *A Prelude to Modern Science,* auspiciously initiated the series.

In the present volume Mrs. Duncum presents a scholarly and exhaustive survey of inhalation anesthesia in the nineteenth century. After setting the stage in the introductory chapter by briefly reviewing the entire field of anesthesia from its beginnings to 1900, including important related historical events, the author takes up each phase in the development of her subject in a very detailed manner. It is written, of course, with an English bias, which is understandable, with emphasis on the development of inhalation apparatus. Unfortunately the story stops at the turn of the century, a point which actually marks the beginning of modern anesthesia, and in spite of advance notice by the author that her discussion concludes at this important juncture in the history of her subject, it is disappointing to find that mention, at least, is not made of cyclopropane, ethylene, the "closed" technique, controlled respiration, anesthesia charts, and other more important advances of the last fifty years.

This attractive book is solidly written, well documented, and profusely illustrated. It includes five appendices in which Morton's inhalers, the term "anaesthesia," resuscitation, warm ether—open ether, and endotracheal anesthesia are more fully discussed and also a chronology of events in the development of anesthesia. The index is adequate.

Dr. Duncum has made an extremely valuable contribution to the history of anesthesia, particularly in the field of early inhalation apparatus. One can only hope that she will take up the story at the beginning of the modern era and continue it down to the present.

Duke University Hospital, Durham, N. C. JOSIAH C. TRENT

CHARLES SINGER and C. RABIN. *A Prelude to Modern Science.* Being a discussion of the history, sources and circumstances of the "Tabulæ Anatomicæ Sex" of Vesalius. Cambridge [Eng.], published for The Wellcome Historical Medical Museum at the University Press, 1946. lxxxvi + 58 pp. + 6 facsim. pl. 50s.

IT IS generally accepted that the fame of Andreas Vesalius (1514-1564) is asso-

ciated with his immortal masterpiece, *De humani corporis fabrica,* and its *Epitome,* both issued in 1543 at Basel. In both are contained the fruits of the very first attempts at applying strict observation to the study of anatomy which as a result was suddenly changed into a modern discipline by its outlook, its methods and technique, by the artistic value of its drawings, and above all, by the new descriptions offered in it as substitutes for those traditional in his time.

But what is difficult to understand is how, amidst Renaissance society, entirely lacking the modern scientific spirit, there appeared suddenly an immense, well-conceived, and highly finished monograph which, in spite of innumerable marks of modernity, still reproduces so many errors inherited from the traditional learning. It is difficult to understand how both could be reconciled within a single human mind.

In this monograph, Dr. Charles Singer, the well-known English historian of medicine, with the collaboration of Dr. C. Rabin, reader in Hebrew in the University of Oxford, has used an earlier work of Vesalius, the *Tabulae anatomicae sex,* published in 1538, as material "in itself *a prelude to modern science,*" of great value for investigating the beginnings of anatomy as the first *observational discipline* studied on modern scientific lines.

The *Tabulae,* issued originally at Venice, in the form of six sheets, 19 x 13½ inches, have been reproduced in the monograph from facsimiles in the Wellcome Library, reduced to about half size upon one of the halves of six double sheets. In this size, the Latin text is quite legible, but it is to be regretted that the whole surface of each sheet was not used, so as to have full-scale reproductions. Furthermore, in 44 pages of the monograph the English translation of the text of the *Tabulae* is offered by the authors, accompanied by 343 valuable notes, provided as a running commentary, with the purpose of solving the many difficulties with which modern students are confronted, particularly in connection with modern equivalents of different Arabic, Hebrew, and Greek anatomical names. In all cases the authors have transliterated these in Latin letters so as to avoid alphabets unfamiliar to ordinary readers.

Up to the forties of the sixteenth century, rigid literary form was considered as the only conventional means for expounding the highly reverenced texts of Galen. The renaissance of art had been of no real consequence for anatomy, because figures were generally considered an undignified means of expression, more adequate for the amateur or the quack. Contrary to this, in the *Tabulae* Vesalius leaves literary form in the second place and gives the first to figures, despite the fact that he considered them insufficient to give real anatomical knowledge, though they could be aids to memory. As a matter of fact, his figures are undoubtedly *"the earliest attempt at a graphic exposition"* to trained men, of both physiological and anatomical detail, superior in artistic quality and more detailed than any of their predecessors (those of Leonardo

alone excepted). Conversely, his text is only a résumé of the newly recovered texts of Galen, grafted upon medieval tradition.

In an attempt to explain the enormous contrast between the *Tabulae* and the *Fabrica,* published but five years later, the authors devote one of the sections of their eighty-six preliminary pages to discussion of the influences to which Vesalius was subjected during his career; another section is given to study of the accuracy of certain anatomical elements in the *Tabulae,* and a third one deals with the Renaissance anatomical vocabulary.

Vesalius began his studies at the age of fourteen in a college at Louvain, then a great center of medieval learning and of opposition to the new humanism. From that time on he had a great passion for dissecting animals. When he was seventeen, he transferred to another college which, under the inspiration of the humanistic spirit of Erasmus, served the purpose of transforming each of its students into a *trilinguis homo,* equally expert in Latin, Greek, and Hebrew. Probably Vesalius was not satisfied with the training there, because his knowledge of Greek was not great, and that of Hebrew amounted to nothing. But he had been changed into a regular trilingual humanist when he left the college and moved to Paris in 1533. Rare dissections had been held there since 1493, although with the specific purpose of verifying Galenic views. Vesalius went at once to dissect many animals, and to examine such human material as he could, in the same spirit as the others. But as his talents and superior skill soon won recognition from his two great teachers, Sylvius and Guenther, and the students, he was asked to assist them in public dissections. Later (1539) he attributed to these activites his first doubt as to the accuracy of Galenic descriptions, but the doubt could only have been a very little one, since it is not very apparent in the *Tabulae,* which in some sense are a companion to the *Anatomical institutions according to the opinion of Galen for students of medicine,* published by his teacher Guenther in 1536.

About the end of that year Vesalius returned to Louvain and upon arriving made his first independent postmortem examination on a female body, finding a *corpus luteum* in the ovary. In the following year he gave the first demonstration of human dissection seen there in eighteen years and introduced the important reform of lecturing on the body while dissecting. Then, after a brief visit to Basel, he went to Italy, where the *Tabulae* were printed in the following year. During the eighteen previous months he must have read most of the few works on anatomy that had been produced by his Italian predecessors: Giorgio Valla; Alessandro Benedictus; Antonio Benivieni; Gabriele Gerbi; Alessandro Achillini; Mundino; Giacopo Berengario da Carpi; Nicolo Massa, Rosso de Rossi, and a few more, some of them authors of illustrated anatomies, or at least of the so-called *fugitive anatomical sheets,* used by stu-

dents of medicine, "who then, as now, were resolved not to burden their memories with superfluous details."

The information for some of the anatomical elements, not only in the *Tabulae* but also in the *Fabrica,* was derived by Vesalius from animals which he had dissected in accordance with the comparative methods that gave a special distinction to the great Paduan anatomical school. But it is to be marvelled at that while describing animals, he claimed to be describing the parts of man, the very fault for which he had denounced Galen. But neither his censoriousness nor his errors are to be too readily or too severely condemned, but should be judged in their own peculiar atmosphere.

Among the non-human details included by Vesalius in his descriptions, the authors point out the following: the *rete mirabile* in Tabula III, which is a very conspicuous feature in Ungulata, much less developed in the Carnivora, is not present in man, monkey, or rodent. The heart drawn in the same Tabula is not the human organ, but probably that of an ape. The great vessels (branches of aortic arch, superior vena cava, caval system, posterior intercostal vessels) are represented throughout in the *Fabrica,* the *Epitome,* and the *Tabulae,* with several non-human details of structure—always under the influence of Galen. The right kidney is pictured at a higher level than the left, in conformity with the statement of Galen, notwithstanding that by autopsy of any human body, the right kidney and its vessels are found at a lower level. In Tabulae I and II, but no more in the *Fabrica,* the liver is represented with five equal lobes arranged more or less symmetrically round a central dome, approximating conditions found in an ape, but not in man. In the figures of generative organs in Tabula I, the erroneous parallelisms between the two sexes which Galen maintained are illustrated, including the parallelism of the male bladder with the female uterus, a particularly gross error. Finally, the sternum in Tabula IV has its lower part abnormally extended, and is drawn with seven segments, instead of five or six, because it was taken from *Macaca.*

The authors consider the *Tabulae* as an almost ideal document for the study of Renaissance anatomical nomenclature and of great value in tracing the passage of the medieval into modern anatomical usage. It was written at a time when there was a general revulsion against the "barbarous" Latin terms of the Middle Ages, with the purpose of having them replaced, where possible, by their classical equivalents taken from Greek and Latin texts newly recovered during the revival of learning. In view of this, the old texts were constantly "castigated" for the purpose of having their vocabulary "purified." A very important help for the task was the *Onomasticon* of Julius Pollux (A.D. 134-192), first printed in Venice in 1502. The modern anatomical vocabulary was formed in its early stages at the Parisian school, through the efforts of Guenther and Sylvius—the effective founders of anatomical nomenclature—

and also at the school of Padua. We are indebted to Vesalius for the inclusion in the *Tabulae* of all those then new terms, thus laying the foundation for the development of a suitable linguistic medium which is such an important factor in the rise of science. By doing it, he also laid the foundation for his *Fabrica* whose great value, of course, is not due to the terminology used in it, but to the modern spirit which inspired it.

Since in glancing at the *Tabulae* the eye is struck by a sprinkling of words in Hebrew characters (most of which are Hebrew, but some are Arabic or arabicized in Hebrew letters), a special section of the Singer-Rabin book is dedicated to the study of Semitic influences on the anatomical vocabulary. The Arabic terms found in the *Tabulae* are derived from the two great sources of the medieval anatomical nomenclature: Arabic terms, which may or may not ultimately go to Greek originals; and, more numerous, transliterated Arabic words more or less modified, often by Hebrew transmitters. The Semitic words quoted by Vesalius in the *Tabulae* are representative of the contemporary oral usage of obscure sources and give a glimpse of the final stages of a separate medical tradition expressed in what was almost a separate language. The *Canon* of Avicenna—the most important of Hebrew medical texts, printed at Naples in 1491—probably did not exert any influence on the *Tabulae,* simply because, as the authors put it, Vesalius was "completely ignorant of both Arabic and Hebrew," notwithstanding his boastful manner to the contrary.

To sum up, from this very erudite analysis made by the authors, it appears that although in the *Tabulae* the first modern pictures for the study of anatomy were used and the "modern anatomical nomenclature," which had just been created, was offered for the first time, the contents remained completely traditional, blindly grounded upon Galenic texts, and with all the errors derived from supplanting human structures with those observed in animals. The isolated notes of modernity (drawings and vocabulary) in reality do not combine yet in forms which might suggest the motifs for the grandiose, immortal prelude of 1543. The problem of ascertaining how the abrupt change took place in Vesalius' mind within a brief period of only five years, remains still to be solved.

México University School of Medicine J. J. IZQUIERDO

REGINALD REYNOLDS. *Cleanliness and Godliness.* Garden City, New York: Doubleday and Co., 1946. viii + 326 pp. $2.75.

IN THE FULL title of his book, Mr. Reynolds presents what is probably the best and most succinct review of its content. In keeping with the quasi-Elizabethan style of the text, the title reads as follows: "Cleanliness and Godliness or the

Further Metamorphosis. A Discussion of the Problems of Sanitation raised by Sir John Harington, together with Reflections upon Further Progress recorded since that Excellent Knight, by his Invention of the Metamorphosed Ajax, Father of Conveniences, revolutionized the System of Sanitation in this country but raised at the same time fresh Problems for Posterity which are discussed in all their implications, with numerous digressions upon all aspects of Cleanliness."

With this summary, which also gives the flavor of the book, a reviewer might rest and regard his task as accomplished. Yet this reviewer feels impelled to say something more, since here is a history and sociology of a relatively unstudied field, though one with which by the very nature of our being we have contact every day—for this is a history of sewage disposal. The author traces the history of the privy and related matters and appurtenances from Mohenjo-Daro and Crete to the present day, dwelling with appropriate emphasis on that historic caesura in the story of sanitation produced by the introduction of the water-closet in 1596 by the Elizabethan poet, Sir John Harington. Impressive is the scholarship with which the author has studied his subject, but even more so is the union of learning with urbanity and wit—a combination which indeed is all too rare.

Mr. Reynolds emphasizes throughout his book the degree to which human excreta disposal and sanitation in general are related to and influenced by factors such as religion, taboo, and asceticism that derive from the cultural environment. Emphasis is also placed on the desirability of utilizing dried sludge for fertilizer, and there is no doubt that there is much to be said for this proposal.

All in all, *Cleanliness and Godliness* is a unique and fascinating production, especially when we learn that it was written in London air-raid shelters during the war. One can do no less than recommend this book to every literate person—butcher, baker, and candlestick maker as well as doctor, lawyer, and sanitary engineer.

GEORGE ROSEN

JACOB R. MARCUS. *Communal Sick-Care in the German Ghetto.* Cincinnati: Hebrew Union College Press, 1947. xiii + 335 pp. $4.00.

IN ASSESSING the status of historical studies on the medicine of the Jews, I believe one may assert without fear of contradiction that the overwhelming majority of such writings in English have been devoted to description and analysis of the medical knowledge manifested in Jewish literature, especially the Bible and the Talmud. Attention has also been devoted to biographical studies of Jewish physicians. No effort, however, has heretofore been made in

this country by medical writers to approach the history of Jewish medicine from a social point of view, that is, to regard medicine as an integral part of the Jewish community.

Among students of Jewish history, on the other hand, this approach has been widely adopted and applied. It is not surprising, therefore, to find a study of communal sick-care among German Jews coming from a professor of Jewish history. In this volume Dr. Marcus undertakes to analyze in some detail the manner in which the Jewish communities of the German lands cared for their sick from the beginning of the sixteenth century to the end of the eighteenth century. The geographical area included in this study is, roughly speaking, the Holy Roman Empire. For purposes of comparison some reference is made to Polish and English institutions. Dr. Marcus has further restricted his study by not attempting to investigate the Spanish-Jewish institutions in North Germany, Holland, or England.

Within these limitations, the author deals first with direct communal care of the sick, discussing in order the communal physician, surgeon, midwives, and other medical personnel such as the druggist, male and female hospital attendants, and bathhouse attendants. Dr. Marcus then proceeds to discuss the origin of the Jewish Sick-Care Society (*Hebra Kaddisha*), its organizational structure, and the program that it was intended to implement. He indicates that such societies first arose in Spain (in this connection it may be mentioned that anyone interested should consult Fritz Baer: *Die Juden im Christlichen Spanien, Urkunden und Regesten. I. Aragonien und Navarra. II. Kastilien. Inquisitionsakten,* Berlin, Schocken Verlag, 1929-1936), and Spanish Jews brought the confraternity idea to Italy, whence it spread to Prague (there were always close relations between Venice and Prague). The line of march for these societies, thus, was from North Italy through Central and Eastern Europe.

The societies were religious guilds and were influenced by the contemporary Christian religious guilds. The Jewish societies were created to relieve the physical and financial distress of the indigent sick, both local and alien, either at home or in a hospital, and to expedite their recovery. The ultimate motivation (or perhaps rationalization) behind this program was religious, in terms of Psalm 41. In a sense, the *Hebra Kaddisha* may be said to have been the chief social welfare agency of the Jewish community.

The societies varied considerably in size, from as few as four (Königsberg, before 1747) to as many as 260 members (Vilna, 1748). Larger societies had an extensive administrative apparatus—executive officers, comptrollers, secretaries and notaries, rabbis, scholars and teachers, cantors for their own synagogues, physicians and surgeons, male and female nurses, and numerous other functionaries. The hospital was the most important institution of the *Hebra,*

but it was never central to its program. In many respects, the Jewish hospital retained characteristics of the ancient *xenodochia.* It was not until the nineteenth century that the modern Jewish hospital came into being.

In a separate chapter Dr. Marcus also deals with women's sick-care societies. Finally, the volume concludes with eighteen appendices dealing with: Jewish folk medicine and religious healing; three broadsides (in Yiddish) on the affairs of the Amsterdam society in 1800, 1801, and 1802; a list of German-Jewish communities and brotherhoods employing physicians; the contract of Dr. Abraham Kisch with the Holy Brotherhood of Breslau for the care of the sick (1767); salaries and fees of German-Jewish Communal Physicians; the origin of the term *Hebra Kaddisha;* the earliest Ashkenazic brotherhoods and a chronological list of German-Jewish Holy Brotherhoods; fast and feastal days of the brotherhoods; similarities between the Jewish and the Christian brotherhoods; the spiritual care of the very sick and the dying; the care of the mentally ill; and a number of topics dealing with the origin and development of the Jewish hospital, including a list of Jewish hospitals in German lands. There is a good bibliography and an index.

This is a solid contribution both to Jewish history and to medical history, and one can only hope that more students will carry on in this field and increase our knowledge of the social aspects of Jewish medicine.

GEORGE ROSEN

GEORGE BANKOFF. *The Conquest of Tuberculosis.* London: MacDonald & Co., 1946. 187 pp. 6/-net.

THIS volume is number three in a series of six issued in England under the caption, "The Conquest Series." The jacket blurb is intriguing to say the least —"Six books on popular medical themes written by a prominent surgeon and author, and designed so as to make entertaining and lucid reading for the layman with no previous technical knowledge of the many wonders of contemporary medical science today."

And the book fulfills the promise. The historical material is interestingly woven throughout the various chapters. The facts about tuberculosis are accurate. There are several minor errors and a major one. On page 32 the word "medical" appears for "mediate" in the title of Laënnec's classic work—an obvious typographical error. On page 47 Koch's announcement of the discovery of the tubercle bacillus should have been reported as being made before the Physiological Society of Berlin and not the "Berlin Medical Society."

The most serious error is on page 40 in Chapter IV where the author discusses the "First Weapons Against Tuberculosis." His statement with respect to the first institution for treatment of tuberculosis in America reads: "Dr. J.

Gleitzmann erected the first private sanatorium in 1875, whilst the Government built at Saranak (*sic*) Lake Adirondack Cottage Sanatorium for the poor." G. Norman Meachen in his book, *A Short History of Tuberculosis,* published in London in 1936 has the correct statement: "The first sanatorium for the poor in the United States was established by Edward Livingston Trudeau (1848-1915) at Saranac Lake, known as the Adirondack Cottage Sanatorium, in 1884."

The discussion in Chapter XVI on "Social Medicine and Tuberculosis" was disappointing to this reviewer. There is evidenced no appreciation of the rôle mass health education has played in the tuberculosis campaign during the past fifty-five years. Nor is there any discussion of the part played in the "conquest" of tuberculosis by the joint efforts of physicians and laymen through the unofficial national tuberculosis organizations.

Aside from these comments, the book is well written and should have a wide audience not only in Great Britain but also in our own country.

Columbus, Ohio ROBERT G. PATERSON

FLORENCE L. MEREDITH. *Hygiene.* 4th ed., Philadelphia and Toronto, The Blakiston Company, 1946. xi + 838 pp., 155 illus. $4.00.

THIS is a textbook for college students on physical and mental health from personal and public aspects. The theme of the book is to present the health situations that may exist in the life of individuals and peoples, the health objectives that arise from them, and what action is scientifically appropriate on the part of the layman. Dr. Meredith is well aware that the field of health is a single unit which has two faces, a public one and a personal one, and that these two aspects are reciprocally interrelated.

Of interest to readers of the *Journal* is the fact that throughout this volume are interwoven sections on the history of medicine. It is gratifying to find the history of medicine being presented to college students, but one wishes that Dr. Meredith could have had these sections checked by someone more conversant with the history, rather than the mythology of medicine. In this way, she might have avoided sending Oliver Wendell Holmes to Vienna to study (p. 183), or crediting Celsus with the introduction of Hippocratic method into Rome, or the statement that only that portion of *De medicina* dealing with surgery has been preserved (p. 100). Similarly, in the account of Paracelsus, numerous erroneous statements occur. The story that he died a violent death is perhaps picturesque, but untrue (p. 103). On page 104, the classic work of Vesalius is erroneously cited as *De humani fabrica.*

Erroneous remarks likewise occur in the section devoted to public health. John Graunt did not publish his book in 1592, but rather in 1662 (p. 149); and it

was Koch, not Pasteur, who in 1876 proved that the anthrax bacillus was the cause of anthrax.

Findings of this kind raise a question in the reviewer's mind. Why do people like the author of the volume under review, who apparently feel the necessity to include historical information, pay so little attention to the accuracy of the information which they present? One can only conclude that they cannot tell the true from the false and would greatly profit from consultation with a medical historian before going to press. It is sincerely to be hoped that the historical errors which mar this otherwise useful book will be corrected in the fifth edition.

GEORGE ROSEN

P. M. ASHBURN. *The Ranks of Death. A Medical History of the Conquest of America.* New York: Coward McCann, 1947. xix + 298 pp. $5.00.

THE contents of the late Colonel Ashburn's book might be summarized as follows: Disease played an enormous rôle in the conquest of this hemisphere. A healthy continent before the arrival of the white man and his black slave, millions of natives fell victims to diseases imported by the intruders. Millions of black slaves perished on the way from Central Africa to the place of exploitation. Probably only one-fourth survived to serve. Medical knowledge of the conquerors and of the conquered was equally low. The early settlers were frequently victims of famine and, in particular, scurvy. The author quite convincingly shows that cases of scurvy might have been misinterpreted as yellow fever.

Small pox, measles, and typhus were the main biological weapons of the whites against the Indians during the sixteenth century. Imported diseases like malaria, yellow fever, and hookworm *(Necator americanus)* have played a tremendous rôle in shaping the history of following centuries. Tuberculosis probably existed, but certainly was not prevalent, and got its rise only with increasing civilization. As far as syphilis is concerned, the author is inclined to think that it was introduced, together with gonorrhea and chancroid, by the white man. The author handles the syphilis problem with great caution, yet his summary of the syphilis controversy is not as comprehensive as the one given by David Riesman in his *Story of Medicine in the Middle Ages* (New York, 1935). Eventually the history of a great many other diseases on this continent like meningitis, dysentery, intestinal helminthiasis, leprosy, leishmaniasis, trachoma, etc. is discussed. In pointing to the rarity of suppuration, the author overlooks the fact that suppuration was equally rare in Europe before the sixteenth century.

Most of the factual errors occur in the fourth chapter, "The Medicine of

the Conquerors." As far as the importation of typhus fever is concerned, I would be more skeptical than the author. It is for very moral reasons that the author credits the Negro with importing malaria. Malaria was our deserved punishment for displacing the African. Still, he gives just as little proof for this thesis as do those who credit the Negro with importing malaria for opposite reasons, because such a nasty deed could only be perpetrated by an inferior race. In view of the thorough infestation of the European invaders, malarization of this continent was perfectly possible without any Negro ever reaching its shore.

The most controversial point is, of course, the author's central thesis that *"America was largely conquered by disease."* Such an attitude is very understandable when coming from a medical man to whom biological reasoning is closer than sociological reasoning. It is also understandable in view of the tremendous material which the author has collected. There is no doubt that the importation of disease facilitated the conquest of the Indians by the whites, and that, on the other hand, disease often made settlement locally impossible or extremely difficult. Yet, if the conquest was primarily conditioned by disease, we would think that the North American and the South American Indians would have equally disappeared, as they were equally assailed by disease. We know that this has not been the case, and that South America is still predominantly Indian. Therefore, it seems to me that in looking for the fundamental laws of the development of conquest we have to turn to factors other than disease. This by no means indicates that Colonel Ashburn's book is not a very valuable contribution to the history of the conquest, and does not explain a great many events otherwise hard to understand.

Colonel Ashburn, former commanding officer of the Army Medical Library, an exceptionally fine medical man, soldier, scholar, and gentleman, unfortunately died before he had given the final touch to his manuscript. It has, therefore, been edited by his son who provided each chapter with a lead, the flowery language and military terminology which are probably not to everybody's taste. In spite of these additions, the book remains a very valuable, interesting, and scholarly study.

University of Wisconsin, Madison ERWIN H. ACKERKNECHT

LYLE STEPHENSON POWELL. *A Surgeon in Wartime China.* Lawrence, Kansas: University of Kansas Press, 1946. 233 pp. $2.50.

THIS book is essentially a record of Dr. Powell's experiences in China as Chief Medical Officer of an American liaison team and Service of Supply Surgeon in the Chinese Army during the years 1944 and 1945. The main topics treated are the tactical moves made by the Chinese and Japanese Armies and the attempts made by the American medical officers to organize modern medical units for the Chinese Armies in the areas where Dr. Powell was stationed.

This discouraging and tremendous task was attacked with vigor, and many creditable results were realized. It will be interesting to see in years to come what permanent effects the labors of these Americans will have made upon the heretofore lackadaisical attitude of the Chinese toward the value of military medicine, hygiene, and sanitation. The book is interestingly written and the reader sometimes receives the impression that these are really personal letters written by Dr. Powell to a friend in the States. Several instances of almost verbatim repetition also contribute to this impression. One cannot but be impressed by the courage with which Dr. Powell faced his numerous and difficult problems. But more admirable, perhaps, is the kindly and humane spirit shown by this doctor in his treatment of all types of Chinese. His charitable and open-minded attitude should be followed by other foreigners in China.

The book, as mentioned above, is mainly concerned with medical military problems, but it also contains a surprising amount of general information on things Chinese. Here one will find numerous general but useful observations on native habits, life, and psychology.

Being in constant contact with Chinese doctors, he had an excellent opportunity to gather information pertinent to many phases of Chinese medical history, but unfortunately only one such attempt is recorded. In speaking of one doctor he says (page 171): "He was a Western-trained doctor, but a man who combined his modern knowledge with what he considered the best and most practical of the ancient Chinese medical lore. We had long, interesting discussions about the old methods of medical care and the uses of drugs and herbs." He then discussed two remedies from the early Chinese pharmacopeias still used by this doctor in the treatment of amoebic dysentery and round worms. Unfortunately he gives only the romanized form of the two Chinese terms and does not identify them.[1]

The student of medical history will not take many notes from this book unless he is particularly interested in modern army medical organization, but the student of military history, the armchair strategist, other wartime surgeons, sinophiles, and many general readers are certain to enjoy and profit from it.

University of California, Los Angeles R. C. Rudolph

[1] It is to be regretted that throughout this book the author uses the new Army "simplified" romanization of Chinese words instead of the standard and long-used Wade-Giles system. Thus his *ya don tze* ("duck egg seed") and *suey chue tze* ("Navy seed") are presumably the equivalent of the Wade-Giles ya tan tze and shui chün tzu. I have not been able to identify these terms in Bretschneider's *Botanicon Sinicum* or the encyclopedic *Tz'u yüan*, the only likely works available to me at this time. Perhaps the terms given by Dr. Powell are colloquial designations of the proper literary names.

BERTRAM M. BERNHEIM. *A Surgeon's Domain.* New York: W. W. Norton & Company, Inc., 1946. 253 pp. $3.00.

HERE you will find, in vivid paragraphs, the story of a surgeon's quest and a surgeon's ideals, the record of his training, and an appreciation of his master. It has been given to but few in the course of half a century to be trained under a master like that great spirit who helped Doctor Bernheim build up his experience and grow to maturity. It was a teacher who imparted to him, frequently with thorns enveloping the lesson, the belief that only in profound thought might be found the approach to the great surgical problems. The familiar picture of the "bull pen," on Friday noons, came to be one of the best known features of the training school of surgery at Johns Hopkins, launched and moulded by "the professor," William S. Halsted.

Doctor Bernheim's story adds a unique volume to the Norton medical series. People will want to read it because, everywhere, they are wanting to know how to recognize the true surgeon when they see him, how to pick the really good one when they are in need. This running account takes them backstage where they may watch the actors getting ready, the make-up being applied, and the players testing out their steps before they appear before the public. Each chapter adds a needed scene and is bound to give the inquiring reader new confidence. We soon find ourselves agreeing that "surgery is more than operations," and that the training of the surgeon is a long, hard road, full of tribulations.

Doctor Bernheim strikes a sound note in his admonition to the surgeon to get away from the "defeatist attitude" that has led to such frequent sacrifice of limbs and organs. "Surgeons," he counsels, "should say to students and doctors alike, who come to watch operations, 'this removal about to be done is the best we can do at the moment . . . amputations, extirpations, sacrifice of organs, should be regarded in the light of temporary expedients. . . . No man can say just when newer developments will make sacrifice unnecessary; but surely they will come.'"

It will be well for laymen and doctors if many of them read this well-told story. It will enable them together to learn of motives and methods, of the mean things that occasionally creep in, as well as of the unselfish lives that are poured out in the service of mankind. Medicine and surgery, if they only will, have it in their power to help greatly in building a better world. Some of the men Doctor Bernheim trained are now at work in Arabia, in Burma, in China. There, too, they are leading students and assistants by the hard road into the lands of the blest in surgery.

It was a wise teacher of old who said, "Narrow is the gate, and straitened the way, that leadeth unto life, and few are they that find it."

New York EDWARD H. HUME, M.D.

W. A. Osborne. *Essays and Studies.* Melbourne: Lothian Publishing Co. Pty. Ltd., 1946. vii + 188 pp. 10/6.

It may well be wondered how many younger scientists of the present generation, writing in English, could produce as cultivated a volume as this. Professor emeritus of physiology at the University of Melbourne, Osborne writes easily and interestingly on classical and English themes. Indeed, until I ran into his expert remarks on scientific subjects I was under the impression that he must be a professor of English with heavy leanings toward the classical side. One has but to read this attractive volume of essays and studies to appreciate the loss which the culture of the English-speaking world has suffered in yielding to the demands of the technological age with its emphasis on physical utility and its ensuing spiritual impoverishment. Men like Osborne who are at home in the humanities and in several of the sciences have become all too rare, so rare, indeed, that their disappearance threatens to deprive us of the last bulwark we have against the corrosive inroads which science *sans* human values makes upon the spirit of man. And yet, even Osborne's science and humanity are not always sufficient to save him from committing a solecism in both, as when in an otherwise excellent essay on "Science in education" he writes in a comparison with Southern California that "Australia has the same climate with the enormous advantage of racial purity." There are scientists who know much less of the humanities than Professor Osborne who could never nod as badly as that. Education in the sciences and in the humanities is apparently not quite enough. It is, seemingly, the attitude of mind in both which is the important qualitative element. It is such an attitude of mind which would have led Professor Osborne to learn that hybridization in man is an advantage, not a disadvantage, and that the cultures of classical antiquity which he so much admires were the products of highly hybridized peoples.

The twenty-two papers which make up this entertaining little volume run all the way from such essays as "Scientific errors in literature," and "Vowel assonance, and Shakespeare commentaries," to papers on "Old age," the Senses, "Poison gas and the evolution of the respirator," "Some physiological landmarks in man's evolution," and "Chess as a pastime." In this busy workaday world these essays and studies make reading of a much needed kind.

Philadelphia, Pa. M. F. Ashley Montagu

Shelby T. McCloy. *Government Assistance in Eighteenth-Century France.* Durham: Duke University Press, 1946. xi + 496 pp. $6.00.

Mr. McCloy, who is professor of history at the University of Kentucky, has made a veritably monumental contribution to our knowledge of the social activities of eighteenth-century France. His stout volume of nearly five hundred

pages fills a sore gap in our information, and doubtless it will take its place in time as the standard work on the subject. While most of it is based upon a meticulous examination of printed materials, the author's archival researches were not slight, and interrupted only by the coming of the war. The work consequently has the quality of freshness, of data garnered at first hand, and by a loving hand. For his accomplishment Mr. McCloy deserves the gratitude of all students in the field. It is therefore all the more regrettable that a work which might have been a classic must be content with the not-too-unworthy characterization of "standard," for reasons which will be brought out.

For the specialist his account of the relief measures that the government administered in every form of need makes engrossing reading. The non-specialist reader could indulge in a little judicious skipping. These numerous activities are presented in an orderly and systematic fashion, in a combined topical-chronological arrangement where the year 1789 serves as the great divide. But they are not treated *in vacuo*. For each group of activities the setting and the background of thought are carefully given. They included assistance to the victims of natural disaster. The sick and the infirm received aid. The government contributed regularly to hospitals in the cities and towns and to medical services in the rural area. Toward the innocent victims of society's maladjustment, as the author euphemistically calls the great upheaval of the new capitalist practices and relations, the government behaved as though they were "wards of the state." Beggars and vagrants also received its attention, albeit obtaining only a stepfatherly care; nor did it remain aloof to the needs of education and learning.

Mr. McCloy's account of this governmental action is full and detailed. He shows the confusing interplay of assistance administered simultaneously and sometimes competitively by several overlapping agencies: the royal government, provincial and municipal authorities, church, charitable societies, and individuals. At first problems were handled locally, and only when they were too large for local solution were they passed over to higher authorities. The shift to increasing governmental relief became so pronounced that in the second half of the century, "the opinion had come to be rather general that care of its needy subjects was a state obligation." This came about, we are told, not because the government wished it, but because the other authorities had failed to cope with the tasks before them. But why they failed (besides, of course, from lack of funds and skilled personnel) and why the obligations of the government had increased so enormously, Mr. McCloy does not bring out very satisfactorily.

In fact his reasoning on this score and his failure to draw the necessary inference from such relief figures as are available constitute the fundamental weakness of his study. He at no time places the entire subject in the broad

frame of the major social-economic phenomena of the century, the continuous advance of capitalist practices—both petty and large scale practices. To slur over, almost bury as he does, the startling contrast between the 19 to 22 million francs that Necker expended on relief in 1781 and the 51.5 millions that the 1790 budget called for, is to reveal either ignorance of the advance or misunderstanding of the true explanation of the increase, or both. The particularly acute crisis of the late 'eighties may be accounted for by specific reasons, true; but it must also be seen, as the author does not see it, as an especially sharp illustration of the general traumatic shock inflicted upon society by the dynamic growth of capitalist economy. Recent studies by French scholars, particularly by Labrousse, make that clear, and they also make clear that the last fifteen years of the old regime were not prosperous, as Mr. McCloy relying upon the outworn authority of Gomel (published 1893) avers they were, but on the contrary were years of economic depression and growing stringency for a rural and urban proletariat that prosperity had created.

In similar fashion, one fears that Mr. McCloy misses the point both of the government's efforts to improve agriculture and the popular opposition to those efforts. Of course reformers in the government administration wished to better the conditions "that led to distress." But they did not intend to lose anything by improving and increasing production and facilitating distribution. As in the case of the contemporary English agricultural reformers, profits and progress were happily equated in their thinking. The obstinacy of "the masses who still favored [the old] governmental control" *versus* the free-enterprise efforts of the spokesmen for large scale and scientific agriculture arose from their experiencing the depressing fact that for the present at least improvement produced great material benefits for the comparatively few great landed proprietors and nothing but more distress for themselves. This Mr. McCloy certainly does not make clear.

Finally, he does not literally mention the word "bienfaisance" that yet fell so easily from the lips of the eighteenth-century reformer. Bienfaisance connoted the ideal and practice of lay charity, of benevolence, kindliness, mercifulness toward man, not for the sake of God but for the sake of man. Government assistance was a very important part of that pattern of faith and thought, of transforming the old dynastic police-state into the seemlier national, welfare-state. Government aid, reform of the cruel criminal procedure, abolition of slavery and serfdom, extinction of poverty and slums, and, most benevolent project of all, establishment of perpetual peace, all hung together. Yet of that profound inner connection the reader would scarcely get an inkling in this otherwise most valuable of studies.

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